Air Quality Assessment For:

Eastbound SR-91 Lane Addition Between SR-241 and SR-71

12-ORA-91 KP 25.628/32.034 (PM15.925/19.905)
8-RIV-91 KP 0.000/4.682 (PM 0.000/2.909)

Caltrans District 12 EA 0G0400
Caltrans District 8 EA 0E800

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September 11, 2006
Report#05-192

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CALTRANS DISTRICT 12 EA 0G0400K

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Executive Summary

This report assesses the potential air quality impacts from the proposed addition of a general purpose lane to the eastbound SR-91 between SR-241 and SR-71. The project sponsor and lead agency is the Orange County Transportation Authority (OCTA). The State of California Department of Transportation (Caltrans) Districts 8 and 12 is the cooperating agency and the Riverside County Transportation Commission (RCTC) is the collaborating agency involved in the project. The western portion of the project is located in Orange County with the city of Yorba Linda to the north of the freeway and the city of Anaheim to the south. The eastern portion of the project is located in Unincorporated Riverside County with the city of Corona located just south of the project.

The proposed project would add a general purpose lane to the south side of the SR-91 freeway between SR-241 and SR-71. Compliance with the Transportation Conformity requirements of the Federal Clean Air Act (FCAA) is demonstrated. A regional air quality analysis is performed to demonstrate that the project will not adversely impact regional air quality. A local air quality analysis is performed to demonstrate that the project will not adversely impact local air quality in the immediate vicinity of the project. The report also discusses potential impacts from Diesel Particulate Matter which has been listed by CARB as a toxic substance and presents measures to reduce PM_{10} emissions during construction. The potential for release of Naturally Occurring Asbestos (NOA) during construction is also discussed.

The project is located in the South Coast Air Basin (SCAB). The South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (CARB) are responsible for regulating air pollutant sources in the Basin. The SCAQMD prepares the Air Quality Management Plan (AQMP) which specifies measures to meet the state and national ambient air quality standards (SAAQS and NAAQS). To show that the project will not adversely impact the region's air quality it must be shown that the project will not result in the transportation system exceeding the air pollutant budgets in the AQMP.

The 2004 Regional Transportation Plan (RTP) and 2006 Regional Transportation Improvement Program (RTIP) prepared by the Southern California Association of Governments (SCAG) are regional plans for future improvements in the areas transportation system. These plans must demonstrate that the air pollutant emissions associated with the transportation plan do not exceed the emissions budgets in the approved AQMP. The proposed project is a part of the 2004 RTP and 2006 RTIP. Therefore, the project will not result in an exceedance of the transportation air pollutant emissions budgets and will not adversely impact regional air quality.

Local impacts, also known as "hot spots" are assessed for CO, PM_{10}, and $PM_{2.5}$. The CO impacts are assessed using the "Transportation Project-Level Carbon Monoxide Protocol" (Protocol) developed by the Institute of Transportation Studies at the University of California Davis for Caltrans. The protocol contains a series of flow charts with criteria to determine that the project will result in local CO concentrations that exceed the state and national AAQS. The flow chart questions and responses are presented in Section 4.2. The analysis shows that CO concentrations in the area affected by the project would be expected to be lower than at those modeled in the SCAB CO Attainment Plan. Therefore, the project will not result in an adverse local CO impact.

The FCAA requires a quantitative analysis of local PM_{10} and $PM_{2.5}$ impacts if the EPA has prepared guidance for this analysis. At this time, a quantitative analysis methodology for assessment of PM_{10} and $PM_{2.5}$ impacts has not been released by the EPA. A qualitative assessment of PM_{10} impacts was performed based on FHWA's "Guidance for Qualitative Project Level "Hot Spot" Analysis in PM_{10} Non-attainment and_Maintenance Areas" and Caltrans' "Caltrans Interim Guidance Project-Level PM_{10} Hot Spot Analysis." This analysis concludes that it is highly unlikely that the project will cause an exceedance of the PM_{10} NAAQS in the vicinity of the project. Therefore, the project will not result in an adverse local PM_{10} impact. An analysis of $PM_{2.5}$ impacts was performed based on EPA's "Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM_{10} and $PM_{2.5}$ Nonattainment and Maintenance Areas." The analysis shows that the project would not be expected to cause any new violations, worsen existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

Impacts from Mobile Source Air Toxics MSAT are also examined. The analysis shows that in 2010 MSAT emissions in the project area may be somewhat greater than existing conditions but that the project would not result in an increase in MSAT emissions compared to no project conditions. Due to the congestion relief provided by the project, MSAT emissions in 2010 would likely be somewhat lower with the project than without. In 2030, MSAT emissions are projected to be lower than existing conditions either with or without the project. The project could result in a slight increase in MSAT emissions in 2030 compared to conditions without the project due to projected increases in traffic of 3.3%. However, lower emission rates resulting from decreased congestion and increased average speed with the project compared to no project conditions would likely largely offset this increase and could even result in a slight decrease in MSAT emissions in 2030 with the project compared to no project conditions.

1.0 Introduction

This report assesses the potential air quality impacts from the proposed addition of a general purpose lane to the eastbound SR-91 between SR-241 and SR-71. Exhibit 1 shows the project location on a regional vicinity map. A local vicinity map and aerial photograph showing the project extents is presented in Exhibit 2.

The project sponsor and lead agency is the Orange County Transportation Authority (OCTA). The State of California Department of Transportation (Caltrans) Districts 8 and 12 is the cooperating agencies and the Riverside County Transportation Commission (RCTC) is the collaborating agency involved in the project. The western portion of the project is located in Orange County with the city of Yorba Linda to the north of the freeway and the city of Anaheim to the south. The eastern portion of the project is located in Unincorporated Riverside County with the city of Corona located just south of the project.

The proposed project would add a general purpose lane to the south side of the SR-91 freeway between SR-241 and SR-71. Compliance with the Transportation Conformity requirements of the Federal Clean Air Act (FCAA) is demonstrated. A regional air quality analysis is performed to demonstrate that the project will not adversely impact regional air quality. A local air quality analysis is performed to demonstrate that the project will not adversely impact local air quality in the immediate vicinity of the project. The report also discusses potential impacts from Diesel Particulate Matter which has been listed by CARB as a toxic substance and presents measures to reduce PM_{10} emissions during construction. The potential for release of Naturally Occurring Asbestos (NOA) during construction is also discussed.

2.0 Project Description

2.1 Background

SR-91 is the only significant transportation facility connecting Orange County and Riverside County. It is heavily used for goods movement from the ports of Los Angeles and Long Beach to inland destinations. SR-91 was built in 1950 but existed as a two-lane highway for some time before that. Within the project limits, SR-91 has four general-purpose lanes in each direction varying in width from 3.3m to 3.6m. In Orange County a toll facility consisting of two 3.3m lanes in each direction exists in the median area. The toll facility, known as the Route 91 Express Lanes, is owned and operated by OCTA. The eastbound toll facility ends in Orange County near the Orange/Riverside County line and becomes two transition lanes. The number one transition lane becomes an HOV (High Occupancy Vehicle—a.k.a. Carpool) lane while the number two transition lane becomes the number one general-purpose lane. This happens via a 600m transition in Riverside County and, as a result, the number five eastbound general-purpose lane is dropped through the SR-91/SR-71 interchange.

SR-241 was built in 1996 and connects to SR-91 at the western limits of construction for this project. In the vicinity of this project SR-71 is listed as an Expressway in the current Route Concept Report and Route Segment Report.

SR-91 is a major corridor in the east-west direction connecting Orange County and Riverside County communities. There are no parallel corridors within a 16-km range. SR-91 operates at full capacity during peak hours in the proposed project area. In the project area there are Express Lanes in the median with their only entry/exit point near the Orange Riverside County line; the SR-241 toll road terminates at SR-91 at the western project limit and join the right-most lane; the general purpose lanes are between these access areas which causes a significant amount of weaving. Additionally the lane and shoulder widths within the project area have been reduced to nonstandard widths with past capacity enhancing projects. High traffic volumes coupled with high weaving volumes and narrow lanes result in a level of service F during peak hours.

2.2 Purpose and Need

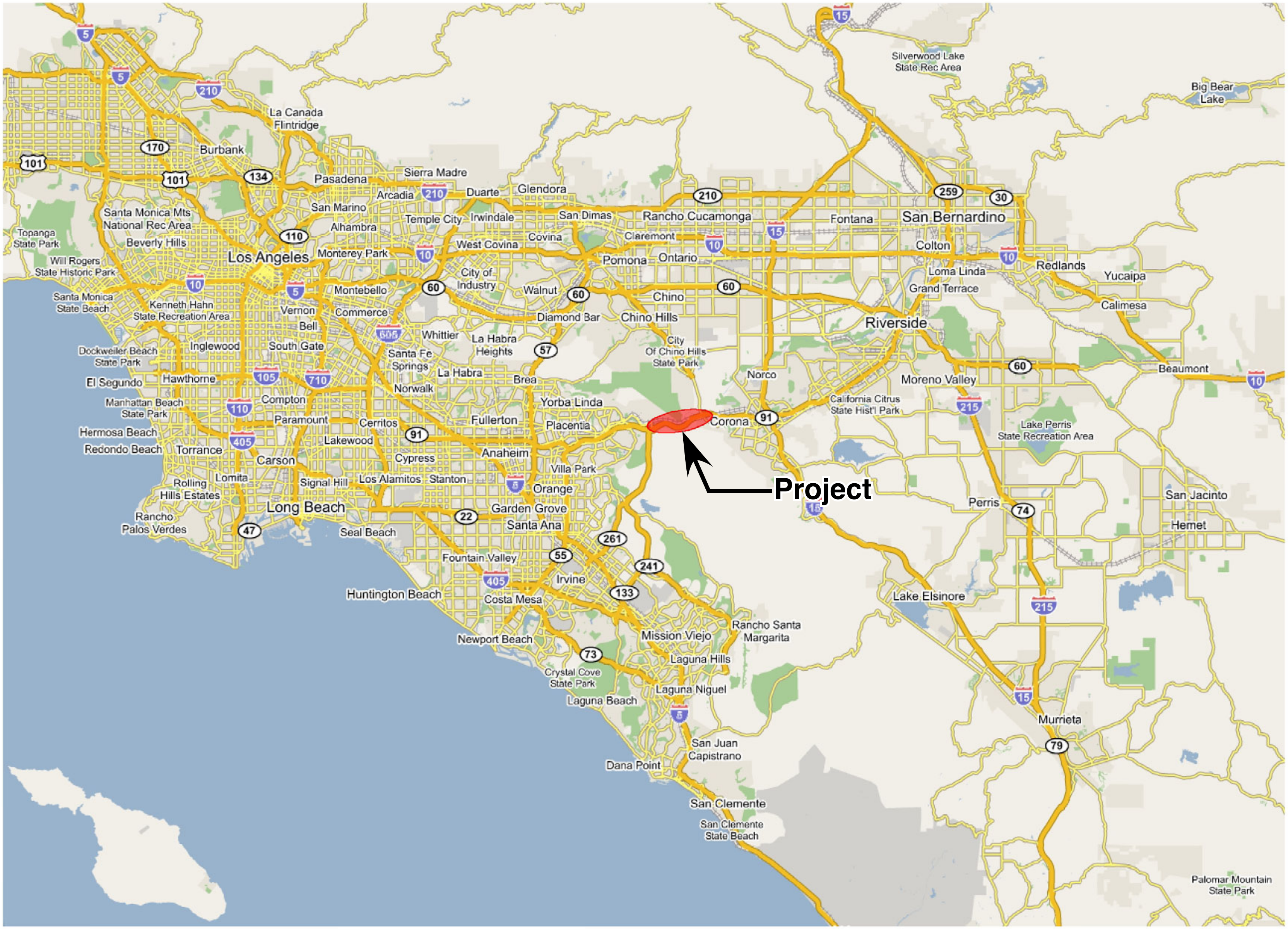
The purpose of this project is to improve weaving between SR-241 and SR-91, as well as reduce the number of vehicles in the SR-91 mainline traffic flow that would be exiting at Green River Drive and SR-71. The standard width lanes and shoulders would enhance safety within the project area

During the P.M. peak period (3 P.M. to 7 P.M on weekdays) the eastbound traffic demand exceeds the capacity of the freeway. Traffic data and field observations also indicate that this segment of eastbound SR-91 becomes congested in the middle of the day on weekends, particularly on Saturdays. Although congestion in the eastbound direction does not normally occur during the A.M. peak traffic period, the weekday A.M. peak hour traffic volume is only slightly less than the P.M. peak hour traffic volume along SR-91.

There are three choke point locations that significantly impact traffic operations and are the primary cause of congestion within the study area. At the junction of northbound SR- 241 and eastbound SR-91 there are five general-purpose lanes on SR-91 that drops to four lanes after a distance of approximately 1.6-krn (near Coal Canyon Road). Thus, the right lane acts as a long merge lane in this area. There is another lane drop along eastbound SR-91 immediately after the connector to northbound SR-71. In addition to these choke points along eastbound SR-91, there is a choke point on northbound SR-71 north of where the connectors from eastbound and westbound SR-91 merge. During the P.M. peak traffic period traffic backs up on these connectors and onto SR-91 in both directions. The purpose of this project is to improve flow by relieving these choke points.

2.3 Proposed Project

For the Environmental Document, two alternatives are under consideration. The No-Build Alternative (Alternative 1) assumes no improvements to the eastbound lanes on SR-91 and is used for comparable purposes. The Build Alternative (Alternative 2), designated as "Alternative 2A" (preferred alternative) in the Project Study Report, is the proposed project. These are described below.

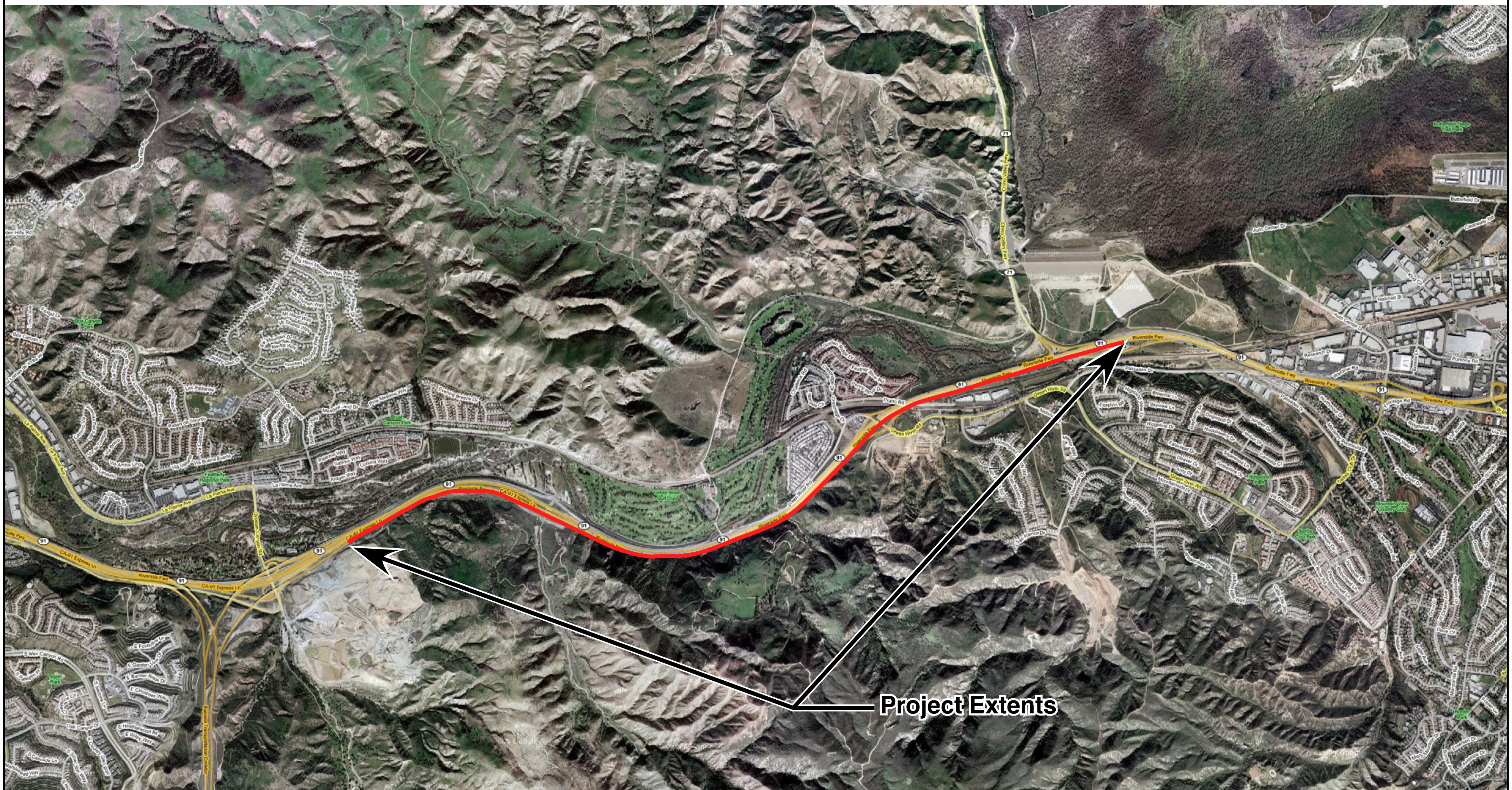


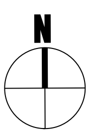
N

0' 2.5 mi. 5 mi.

Exhibit 1
Regional Vicinity Map

Mestre Greve Associates





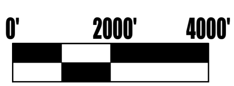


Exhibit 2
Local Vicinity Map

Mestre Greve Associates

2.3.1 Alternative 1

This alternative is the no-build alternative. Under this alternative, no improvements would be made to the eastbound lanes on SR-91. The no-build option does not address the existing traffic congestion or poor operations in the eastbound direction.

2.3.2 Alternative 2

This alternative proposes to provide one 3.6m general purpose lane in the eastbound direction which would run from the SR-241/SR-91 interchange to the SR-71/SR-91 interchange. This additional lane would improve capacity, improve operations, improve regional circulation, and enhance safety. It would also remove the lane drop choke point east of SR-241 at Coal Canyon mentioned previously in Section 3. This alternative also proposes to provide all lanes and shoulder's on eastbound SR-91 at standard widths (3.6m lanes and 3.0m shoulders) including the median shoulder throughout the length of the project. Maintenance access would be maintained at Coal-Canyon. The eastbound SR- 91 to northbound SR-71 and southbound SR-71 to eastbound SR-91 connectors would each be improved to provide one standard width (3.6m) lane with standard 1.5m left shoulders and nonstandard 2.4m outside shoulders. A Mandatory Design Exception Fact Sheet will be approved to address the nonstandard shoulder width (2.4m proposed, 3.0m standard)

3.0 Regulatory Framework

The proposed project is located in the South Coast Air Basin (SCAB) and, jurisdictionally, is the responsibility of the South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (CARB). The SCAQMD sets and enforces regulations for stationary sources in the basin and works with SCAG to develop and implement Transportation Control Measures. The CARB is charged with controlling motor vehicle emissions. CARB establishes legal emission rates for new vehicles and is responsible for the vehicle inspection program. Other important agencies in the air quality management for the basin include the U.S. Environmental Protection Agency (EPA) and the Southern California Association of Governments (SCAG). The EPA implements the provisions of the Federal Clean Air Act. This Act establishes ambient air quality standards that are applicable nationwide. In areas that are not achieving the standards, the Clean Air Act requires that plans be developed and implemented to meet the standards. The EPA oversees the efforts in this air basin and insures that appropriate plans are being developed and implemented. SCAQMD is the primary agency responsible for writing the Air Quality Management Plan (AQMP), with SCAG's collaboration in preparing the transportation control measure component of the Plan.

SCAQMD and SCAG, in coordination with local governments and the private sector, have developed the Air Quality Management Plan (AQMP) for the air basin. The AQMP is the most important air management document for the basin because it provides the blueprint for meeting state and federal ambient air quality standards. The AQMP for the basin is included in the State Implementation Plan (SIP) which is the document that demonstrates compliance with FCAA. The 2003 AQMP is the current approved applicable air plan. The plan was adopted locally on August 1, 2003, by the governing board of the SCAQMD. CARB adopted the plan as part of the California State Implementation Plan on October 23, 2003. The EPA adopted the mobile source emission budgets on March 25, 2004. The PM_{10} attainment plan received final approval on November 5, 2005 with an effective date of December 14, 2005. The EPA has not approved the ozone or CO attainment plans to date. For federal purposes, the 1997 AQMP with the 1999 amendments is the currently applicable Ozone attainment plan. The CO attainment plan in the 1997 AQMP was approved by the EPA but only on an interim basis through 1998. Therefore, the basin does not have a federally approved CO attainment plan.

State law mandates the revision of the AQMP at least every three years, and federal law specifies dates certain for attaining criteria pollutant standards, and preparing plans to meet them. Under federal law, the U.S. Environmental Protection Agency (EPA) has designated SCAB as a non-attainment area for ozone, carbon monoxide, and suspended particulates. The SCAB has met the federal nitrogen dioxide standards for the third year in a row, and therefore, is qualified for redesignation to attainment. A maintenance plan for nitrogen dioxide is included in the 2003 AQMP. Under California state law, the California Clean Air Act (CCAA) mandates the implementation of a program that will achieve the California Ambient Air Quality Standards (CAAQS) and the CCAA mandates the implementation of new air quality performance standards.

EPA has designated SCAB as extreme non-attainment for 1-hour ozone, and serious non-attainment for PM_{10} and CO. Attainment of all federal PM_{10} health standards is to be achieved by December 31, 2006, and ozone standards are to be achieved by November 15, 2010. For CO, the deadline was to be December 31, 2000 however the basin was granted an extension. The SCAB has not had more than one violation of the federal CO standard in the past two years. Therefore, the SCAB has met the criteria for CO attainment. However, SCAB is still formally designated as a non-attainment area for CO until USEPA redesignates it as an attainment area.

In 1997, the EPA established an 8-hour standard for ozone and standards for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). In 1999, a federal court ruling (American Trucking Associations, Inc., et al., v. United States Environmental Protection Agency) blocked implementation of these standards. In February 2001, the United States Supreme Court upheld the standards but remanded some issues back to the Circuit Court. In March 2002, the Circuit Court upheld the standards.

EPA announced air quality designations for the new 8-hour ozone standard on April 15, 2004. The SCAB was designated severe-17 non-attainment. The SCAQMD now has until 2007 to submit a plan showing measures to reduce 8-hour ozone levels to below the federal standard by June 15, 2021. As a part of the designation, the EPA announced that the 1-hour ozone standard would be revoked, effective June 15, 2005. Thus, the 8-hour ozone standard attainment deadline of 2021 supercedes and replaces the current 1-hour ozone standard attainment deadline of 2010. On April 28, 2005 CARB adopted an 8-hour ozone standard of 0.070 ppm. The California Office of Administrative Law approved the rulemaking and filed it with the Secretary of State on April 17, 2006. The standard becomes effective on May 17, 2006.

EPA announced its final air quality designations for the new $PM_{2.5}$ standard on December 17, 2004, designating the SCAB as a non-attainment area. The SCAQMD will have three years to submit a plan showing measures to meet the $PM_{2.5}$ standards. The plan will need to demonstrate that the area will attain the $PM_{2.5}$ standards "as expeditiously as practicable" but no later than 2010. EPA may grant attainment date extensions of up to five years in areas with more severe $PM_{2.5}$ problems and where emissions control measures are not available or feasible.

On June 20, 2002, the CARB revised the state's PM_{10} annual average standard to 20 μg/m3 and establish an annual average standard for $PM_{2.5}$ of 12 μg/m3. These standards were approved by the Office of Administrative Law in June of 2003 and are now effective.

The overall control strategy for the 2003 AQMP is to meet applicable state and federal requirements and to demonstrate attainment with ambient air quality standards. The 2003 AQMP contains short- and long-term measures. These measures are included in Appendix IV-B of the AQMP.

Short-term measures propose the application of available technologies and management practices between 2005 and the year 2010. The 2003 AQMP includes 24 short-term control measures for stationary and mobile sources that are expected to be implemented within the next several years. The stationary source measures in the 2003 AQMP include measures from the 1997 AQMP and 1999 Amendment to the Ozone SIP with eleven additional new control measures. In addition, a new transportation conformity budget backstop measure is included in the 2003 AQMP.

One long-term measure for stationary sources is included in the 2003 AQMP. This control measure seeks to achieve additional Volatile Organic Compounds (VOC-an Ozone precursor) reductions from stationary sources. The long-term measure is made up of Tier I and Tier II components. Tier I long-term measure has an adoption date between 2005 and 2007 and implementation date between 2007 and 2009 for Tier I. Tier II has an adoption date between 2006 and 2008 and implementation date between 2008 and 2010.

To ultimately achieve ambient air quality standards, additional emission reductions will be necessary beyond the implementation of short-term measures. Long-term measure relies on the advancement of technologies and control methods that can reasonably be expected to occur between 2005 and 2010. Additional stationary source control measures are included in Appendix IV-B of the AQMP, Proposed 2003 State and Federal Strategy for the California SIP. Contingency measures are also included in Appendix IV-Section 2 of the 2003 AQMP.

3.1 The Clean Air Act Amendments of 1990

The Clean Air Act Amendments of 1990 (Pub.L.101-549) directs the US EPA to implement strong environmental policies and regulations that will ensure cleaner air quality. These amendments will affect the proposed project. According to Title 1, Section 101, Paragraph F of the amendments, "no federal agency may approve, accept, or fund any transportation plan, program, or project unless such plan, program, or project has been found to conform to any applicable state implementation plan (SIP) in effect under this act." Title I of the amendments defines conformity as follows:

> Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards; and
>
> (i) That such activities will not cause or contribute to any new violation of any NAAQS in any area;
>
> (ii) That such activities will not increase the frequency or severity of any existing violation of any NAAQS in any area; or
>
> (iii) That such activities will not delay timely attainment of any NAAQS.

A chronology of Transportation Conformity Milestones is presented below.

3.1.1 Chronology of Transportation Conformity Milestones

The basis of regional and project-level air quality analysis date back to the passage of the federal Clean Air Act of 1970 (FCAA) (Pub. L.101-549). Since inception of FCAA, many milestones to improve air quality has been undertaken through various laws, regulations, and rules. Several of the significant achievements are highlighted.

- In 1976, the California Legislature adopted the Lewis Air Quality Management Act that created the Air Quality Management Districts (AQMDs) in addition to Air Quality Control Districts (AQCDs). Though separate from federal actions, the creation of AQMDs is an integral part of transportation conformity. The AQMDs and AQCDs promulgate the State Implementation Plans (SIPs) for achieving cleaner air quality on a region by region basis. The SIP is a legal agreement between California and the federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analysis. The appropriate Metropolitan Planning Organization (MPO) performs the project-level regional analysis which is used by the project sponsor and is used for conformity determinations. For both analyses, the AQMD or AQCD for the area provide technical assistance.

- Amendments were added that culminated in the federal Clear Air Act Amendments of 1977 (Pub. L.95-95). The key provisions of the 1977 FCAA ascertained the assurance of conformity as an affirmative responsibility of the head of each Federal agency and that no MPO could approve any transportation plan, program, or project that did not conform to a SIP. Specifically, the 1977 CAA stated: “No Federal department shall 1) engage in, 2) support in any way or provide financial assistance for, 3) license or permit, or 4) approve any activity which does not conform to a (State Implementation Plan) after it has been approved or promulgated”.

- The most recent revision to the FCAA is the federal Clean Air Act Amendment of 1990 [FCAA §176(c)(1), 42 U.S.C. § 7506 (c)(1)]. The scope and content of transportation conformity provisions were expanded to require the reconciliation of the emissions impacts of transportation plans, programs, and projects with the SIP. Specifically, transportation plans, programs, and projects must conform to the purpose of the SIP. This integration of transportation and air quality planning is intended to ensure that transportation plans, programs, and projects will not: "(i) cause or contribute to any new violation of any standard in any area; (ii) increase the frequency or severity of any existing violation of any standard in any area; or (iii) delay timely attainment of any standard or any required interim emissions reductions or other milestones in any area".

- The 1990 FCAA required a mechanism to conform the transportation plans, programs, and projects to the SIPs. This was accomplished by the development of the Transportation Conformity Rule (40 CFR Parts 51 and 93) in 1993. This rule established the criteria and procedures by which the FHWA, the FTA, and MPO entities determine the conformity of Federally funded or approved highway and transit plans, programs, and projects to SIP provisions.

- Subsequently, several revisions were made to the Transportation Conformity Rule. The August 1997 Transportation Conformity Rule Amendments revised the rule to: 1) streamline and clarify regulatory text; 2) eliminate the build/no-build test when SIP budgets have been submitted; 3) provide more flexibility even where there are no submitted SIP budgets; 4) allow for previously planned non-Federal projects to go forward when there is no currently conforming transportation plan/TIP (the Court found this provision invalid and it no longer applies); 5) limit network-based modeling requirements to large, urban areas; 6) provide rural areas the flexibility to choose among several conformity tests; 7) streamline and clarify modeling requirements; and 8) makes consequences of a EPA SIP disapproval without a protective finding less severe (the court found this provision invalid and it no longer applies).

- In March of 2006, the Transportation Conformity Rule was updated to include regulations for performing qualitative analysis of PM_{10} and $PM_{2.5}$ Hotspot impacts. Only projects that are considered "Projects of Air Quality Concern" are required to perform an analysis. Projects of air quality concern are defined, generally, as those for new or expanded highway projects that have a significant number of or significant increase in diesel vehicles, projects affecting intersections that are Level of Service D, E, or F with a significant number of diesel vehicles, new or expanded bus and rail terminals and transfer points with a significant number of diesel vehicles congregating in a single location, and projects in or affecting locations, areas ore categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan as sites of possible violation. The rule allows for projects who have prepared a PM_{10} Hotspot analysis based on prior guidance to use that analysis without any changes.

3.2 Criteria Pollutants

Since the passage of FCAA and subsequent amendments, the US EPA has established and revised the National Ambient Air Quality Standards (NAAQS). The NAAQS was established for six major pollutants or criteria pollutants. The NAAQS are two tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (i.e., impairment of visibility, damage to vegetation and property). The six criteria pollutants are ozone (O_3), carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). Table 1 presents the state and national ambient air quality standards. A brief explanation of each pollutant is presented follows the table.

3.2.1 Ozone (O_3)

Ozone is a toxic gas that irritates the lungs and damages materials and vegetation. Ozone is a secondary pollutant; it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO_2, which occur only in the presence of bright sunlight. Pollutants emitted from areas cities react during transport downwind to produce the oxidant concentrations experienced in the area.

3.2.2 Particulate Matter (PM_{10} & $PM_{2.5}$)

Particulate matter includes both aerosols and solid particles of a wide range of size and composition. Of particular concern are those particles between 10 and 2.5 microns in size (PM_{10}) and smaller than or equal to 2.5 microns ($PM_{2.5}$). The size of the particulate matter is referenced to the aerodynamic diameter of the particulate. The principal health effect of airborne particulate matter is on the respiratory system. The $PM_{2.5}$ are formed from photochemical reactions between volatile organic gases and O_3. PM_{10} are entrained in the atmosphere through construction activities and vehicular travels.

3.2.3 Carbon Monoxide (CO)

Carbon monoxide is a colorless and odorless gas, which, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Carbon monoxide combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High carbon monoxide concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. Carbon monoxide concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections, along heavily used roadways carrying slow-moving traffic, and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of carbon monoxide are limited to locations within a relatively short distance (300 to 600 feet [90 to 185 meters]) of heavily traveled roadways. Overall carbon monoxide emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

3.2.4 Nitrogen Oxides (NO_X)

Nitrogen oxides from automotive sources are some of the precursors in the formation of ozone and secondary particulate matter. Ozone and particulate matter are formed through a series of photochemical reactions in the atmosphere. Because the reactions are slow and occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from the source of precursor emission. The effects of nitrogen oxides emission are examined on a regional basis.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 $\mu g/m^3$)		0.08 ppm (157 $\mu g/m^3$)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		50 $\mu g/m^3$		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		65 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	15 $\mu g/m^3$		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	Gas Phase Chemi-luminescence	0.053 ppm (100 μg/m3)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1 Hour	0.25 ppm (470 $\mu g/m^3$)		—		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 $\mu g/m^3$)	—	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (365 $\mu g/m^3$)	—	
	3 Hour	—		—	0.5 ppm (1300 $\mu g/m^3$)	
	1 Hour	0.25 ppm (655 $\mu g/m^3$)		—	—	—
Lead[8]	30 Day Average	1.5 $\mu g/m^3$	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 $\mu g/m^3$	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24 Hour	25 $\mu g/m^3$	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[8]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chromatography			

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calender year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25¡C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25¡C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.
8. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

3.2.5 Lead (Pb)

Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the blood-forming or hematopoletic, the nervous, and the renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological, and gastrointestinal systems, although there is significant individual variability in response to lead exposure. Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles, and decline in production of leaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e. lead smelters) and are not applied to transportation projects.

3.2.6 Sulfur Oxides (SO_x)

Sulfur oxides constitute a class of compounds of which sulfur dioxide (SO_2) and sulfur trioxide (SO_3) are of greatest importance. The oxides are formed during combustion of the sulfur components in motor fuels. Relatively few sulfur oxides are emitted from motor vehicles since motor fuels are now de-sulfured. The health effects of sulfur oxides include respiratory illness, damage to the respiratory tract, and bronchia-constriction.

4.0 Environmental Setting

4.1 Climate

The climate in and around the project area, as with all of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. It maintains moderate temperatures and comfortable humidity, and limits precipitation to a few storms during the winter "wet" season. Temperatures are normally mild, excepting the summer months, which commonly bring substantially higher temperatures. In all portions of the basin, temperatures well above 100 degrees F. have been recorded in recent years. The annual average temperature in the basin is approximately 62 degrees Fahrenheit.

Winds in the project area are usually driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes. At night the wind generally slows and reverses direction traveling towards the sea. Wind direction will be altered by local canyons, with wind tending to flow parallel to the canyons. During the transition period from one wind pattern to the other, the dominant wind direction rotates into the south and causes a minor wind direction maximum from the south. The frequency of calm winds (less than 2 miles per hour) is less than 10 percent. Therefore, there is little stagnation in the project vicinity, especially during busy daytime traffic hours.

Southern California frequently has temperature inversions which inhibit the dispersion of pollutants. Inversions may be either ground based or elevated. Ground based inversions, sometimes referred to as radiation inversions, are most severe during clear, cold, early winter mornings. Under conditions of a ground-based inversion, very little mixing or turbulence occurs, and high concentrations of primary pollutants may occur local to major roadways. Elevated inversions can be generated by a variety of meteorological phenomena. Elevated inversions act as a lid or upper boundary and restrict vertical mixing. Below the elevated inversion, dispersion is not restricted. Mixing heights for elevated inversions are lower in the summer and more persistent. This low summer inversion puts a lid over the South Coast Air Basin (SCAB) and is responsible for the high levels of ozone observed during summer months in the air basin.

4.2 Monitored Air Quality

Air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates for the SCAB have been made for existing emissions ("2003 Air Quality Management Plan", August 1, 2003). The data indicate that mobile sources are the major source of regional emissions. Motor vehicles (i.e., on-road mobile sources) account for approximately 45 percent of volatile organic compounds (VOC), 63 percent of nitrogen oxide (NOx) emissions, and approximately 76 percent of carbon monoxide (CO) emissions.

The SCAQMD has divided the SCAB into 38 air-monitoring areas with a designated ambient air monitoring station representative of each area. The west end of the project is in the area represented by measurements made at the La Habra monitoring station. The La Habra station is located near the intersection of Euclid Street and Lambert Road in the City of La Habra approximately 15 miles east-northeast from the project site. The east end of the project is located in the area represented by measurements made at the Norco-Norconian monitoring station. This station is located at the Corona (Norco) Naval Warfare Assessment Station approximately two-thirds of a mile west of I-15 between 3rd Street and 5th Street and approximately 5 miles west of the project site. The pollutants measured at the La Habra Station include CO, nitrogen dioxide (NO_2), and ozone. The only pollutant monitored at the Norco-Norconian site is PM_{10}. The air quality data monitored from 2001 to 2005 for these two sites are presented in Table 2 and Table 3. Note that PM_{10} measurement data for 2005 at the Norco-Norconian site presented at the CARB website is not complete. Data for only 47% of the time that high PM_{10} levels would be expected is included in Table 3 and the values presented in the table could change as additional data is included.

$PM_{2.5}$ is not monitored at either the La Habra or Norco-Norconian sites. The next nearest site to the project is the Ontario monitoring site located in the vicinity of the intersection of Central Avenue and West Francis Street in the City of Ontario approximately 12 miles north of the project site. The southern end of the area represented by the Ontario site is located just north of the project. The Ontario site only monitors PM_{10} and $PM_{2.5}$. The air quality data monitored from 2001 to 2004 for the Ontario Site is presented in Table 4. Note that PM_{10} measurement data for 2005 at the Ontario site presented at the CARB website is not complete. Data for only 66% of the time that high PM_{10} levels would be expected is included in Table 4 and the values presented in the table could change as additional data is included.

The monitoring data presented in Table 2, Table 3 and Table 4 was obtained from the CARB air quality data website (www.arb.ca.gov/adam/). Federal and State air quality standards are also presented in the Tables.

Table 2
Air Quality Levels Measured at the La Habra Monitoring Station

Pollutant	California Standard	National Standard	Year	% Msrd.[1]	Max. Level	Days State Standard. Exceeded	Days National Standard. Exceeded[2]
Ozone	0.09 ppm for 1 hr.	0.12 ppm[4] for 1 hr.	2005	95	0.094	0	0
			2004	97	0.099	6	0
			2003	99	0.165	7	1
			2002	99	0.121	3	0
			2001	100	0.114	4	0
Ozone	0.070 ppm for 8 hr.	0.08 ppm for 8 hr.	2005	95	0.075	--	0
			2004	97	0.079	--	0
			2003	99	0.087	--	2
			2002	99	0.079	--	0
			2001	100	0.089	--	2
CO	20 ppm for 1 hour	35 ppm for 1 hour	2005	100	6.8	0	0
			2004	97	7.4	0	0
			2003	100	8.4	0	0
			2002	100	10.2	0	0
			2001	100	10.7	0	0
CO	9.0 ppm for 8 hour	9 ppm for 8 hour	2005	97	3.07	0	0
			2004	97	4.09	0	0
			2003	98	4.29	0	0
			2002	97	4.49	0	0
			2001	99	4.67	0	0
NO_2 (1-Hour)	0.25 PPM for 1 hour	None	2005	98	0.090	0	n/a
			2004	96	0.105	0	n/a
			2003	99	0.158	0	n/a
			2002	89	0.116	0	n/a
			2001	100	0.130	0	n/a
NO_2 (AAM[3])	None	0.053 ppm AAM[2]	2005	98	0.025	n/a	no
			2004	96	0.025	n/a	no
			2003	99	0.028	n/a	no
			2002	89	0.025	n/a	no
			2001	100	0.027	n/a	no

1. Percent of year where high pollutant levels were expected that measurements were made
2. For annual averaging times a yes or no response is given if the annual average concentration exceeded the applicable standard.
3. Annual Arithmetic Mean
4. With the implementation of the federal 8-hour ozone standard, the 1-hour standard was revoked as of June 15, 2005. The previous standard is provided for informational purposes.

-- Data Not Reported
n/a – no applicable standard
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 5/2/06

Table 3
Air Quality Levels Measured at the Norco-Norconian Monitoring Station

Pollutant	California Standard	National Standard	Year	% Meas.[1]	Max. Level	Days State Standard Exceeded[2]	Days National Standard Exceeded[2]
Particulates	50 ug/m3	150 ug/m3	2005	47	64	--	--
PM_{10}	for 24 hr.	for 24 hr.	2004	89	76	11/70	0/0
(24 Hour)			2003	96	116	14/89	0/0
			2002	91	78	17/--	0/0
			2001	90	109	18/--	0/0
Particulates	20 ug/m3	50 ug/m3	2005	47	--	--	--
PM_{10}	AAM[3]	AAM[3]	2004	89	38	Yes	No
(Annual)			2003	96	41	Yes	No
			2002	91	44	Yes	No
			2001	90	--	--	--

1. Percent of year where high pollutant levels were expected that measurements were made
2. For annual averaging times a yes or no response is given if the annual average concentration exceeded the applicable standard. For the PM_{10} 24 hour standard, daily monitoring is not performed. The first number shown in Days State Standard Exceeded column is the actual number of days measured that State standard was exceeded. The second number shows the number of days the standard would be expected to be exceeded if measurements were taken every day.
3. Annual Arithmetic Mean

-- Data not reported
n/a – no applicable standard
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 5/2/06

Table 4
Air Quality Levels Measured at the Ontario Monitoring Station

Pollutant	California Standard	National Standard	Year	% Meas.[1]	Max. Level	Days State Standard Exceeded[2]	Days National Standard Exceeded[2]
Particulates	50 ug/m3	150 ug/m3	2005	66	76	--	--
PM_{10}	for 24 hr.	for 24 hr.	2004	93	93	14/--	0/0
(24 Hour)			2003	100	149	15/90	0/0
			2002	100	91	23/--	0/0
			2001	99	166	27/154	1/6
Particulates	20 ug/m3	50 ug/m3	2005	66	--	--	--
PM_{10}	AAM[3]	AAM[3]	2004	93	43	Yes	No
(Annual)			2003	100	43	Yes	No
			2002	100	45	Yes	No
			2001	99	52	Yes	No
Particulates	No	65 ug/m3	2005	--	88	n/a	1
$PM_{2.5}$	Standard	for 24 hr.	2004	--	86	n/a	2
(24 Hour)			2003	--	89	n/a	3
			2002	--	65	n/a	0
			2001	--	71	n/a	2
Particulates	12 ug/m3	15 ug/m3	2005	--	19	Yes	Yes
$PM_{2.5}$	AAM[3]	AAM[3]	2004	--	23	Yes	Yes
(Annual)			2003	--	24	Yes	Yes
			2002	--	25	Yes	Yes
			2001	--	27	Yes	Yes

1. Percent of year where high pollutant levels were expected that measurements were made
2. For annual averaging times a yes or no response is given if the annual average concentration exceeded the applicable standard. For the PM_{10}24 hour standard, daily monitoring is not performed. The first number shown in Days State Standard Exceeded column is the actual number of days measured that State standard was exceeded. The second number shows the number of days the standard would be expected to be exceeded if measurements were taken every day.
3. Annual Arithmetic Mean

-- Data not reported
n/a – no applicable standard
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 6/2/06

The monitoring data presented in Table 2, Table 3, and Table 4 show that ozone and particulate matter (PM_{10} and $PM_{2.5}$) are the air pollutants of primary concern in the project area.

The State 24-hour concentration standards for PM_{10} have been exceeded between 70 and 154 days each year between 2001 and 2004 at the Norco-Norcanian and Ontario monitoring stations. The Federal standards for PM_{10} were exceeded once at the Ontario Station in 2001 and were not exceeded in 2001 through 2004 at the Norco-Norconian station. It is unlikely that the standard was exceeded at either station in 2005. The State annual average standard has been exceeded for the past five years at both the Norco-Norcanian and Ontario stations but the Federal standard has not.

The Federal 24 hour standard for $PM_{2.5}$ was exceeded 3 days in 2003, only 2 days in both 2001 and 2004, one day in 2005, and was not exceeded in 2002 at the Ontario Station. The annual average $PM_{2.5}$ concentration has exceeded both the State and Federal standards for the past ive years at the Ontario Station. There does not appear to be a noticeable trend in either maximum particulate concentrations or days of exceedances in the area. Particulate levels in the area are due to natural sources, grading operations, and motor vehicles.

According to the EPA, some people are much more sensitive than others to breathing fine particles (PM_{10} and $PM_{2.5}$). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM_{10} and $PM_{2.5}$. Other groups considered sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive, because many breathe through their mouths.

The State 1-hour ozone standard was exceeded between 3 and 7 days each year between 2001 and 2005 at the La Habra station. The State 1-hour ozone standard was not exceeded in 2005 at the La Habra Station. As of June 15, 2006 the Federal 1-hour Ozone standard was revoked with the implementation of the 8- hour standard. The Federal 1-hour ozone standard was exceed 1 day in the past five years at the La Habra monitoring station. The Federal 8-hour ozone standard was exceeded between 0 and 2 days each year over the past five years at the La Habra station. The recently adopted State 8-hour Ozone standard has also been exceeded but the CARB website is not currently reporting the total number of days. There does not appear to be a noticeable trend in either maximum ozone concentrations or days of exceedances in the area.

Ozone is a secondary pollutant; it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO_2, which occur only in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in the area. Many areas of the SCAQMD contribute to the ozone levels experienced at the monitoring station, with the more significant areas being those directly upwind.

CO is another important pollutant that is due mainly to motor vehicles. Currently, CO levels in the project region are in compliance with the State and Federal 1-hour and 8-hour standards. High levels of CO commonly occur near major roadways and freeways. CO may potentially be a continual problem in the future for areas next to freeways and other major roadways.

The monitored data shown in Table 2, Table 3, and Table 4 show that other than ozone, PM_{10} and $PM_{2.5}$ exceedances as mentioned above, no State or Federal standards were exceeded for the remaining criteria pollutants.

4.3 Sensitive Receptors

Generally, sensitive receptors are facilities or land uses that include members of the population sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Exhibit 2 shows the location of residential uses in the vicinity of the project. There is a child care center and a non-medical assistive living home located along La Plama Avenue, across the Santa Ana River from the project at the west end of the project. There are no other hospitals, health care facilities, convalescent homes or schools within 2 miles of the project.

5.0 Regional Air Quality Analysis

5.1 Rules and Implementation

The authority requiring projects to undergo a regional emissions analysis originates from section 176 (c) of the Clean Air Act Amendments of 1990. The law is codified as title 23 of the United States Code (23 U.S.C) and is known as the Federal Transit Act. The regulations cited to implement 23 U.S.C is contained in title 40 of the Code of Federal Regulation parts 51 and 93 (40 CFR 51 and 40 CFR 93). Parts 51 and 93 are commonly recognized as the Transportation Conformity Rule. On August 15, 1997 the Federal Register, published a public notice in which the US EPA requested to streamline the 40 CFR 51 & 93. The final rule issued by the US EPA modified 40 CFR 51 and 93, and classified the Transportation Conformity Rule as 40 CFR 51.390 and 40 CFR 93.100 – 93.128.

The Transportation Conformity Rule requires a regional emissions analysis to be performed by the MPO for projects within its jurisdiction. For the Basin, the MPO is the Southern California Association of Governments (SCAG). The regional emissions analysis includes all projects listed in the Regional Transportation Plan (Plan or RTP) and the Regional Transportation Improvement Program (TIP or RTIP). The RTP is a planning document spanning a 25-year period and the TIP implements the Plan on a 6-year increment. Both Plan and TIP must support an affirmative conformity finding to obtain FHWA approval. Projects that are included in the regional analysis are listed in the TIP and referenced in the Plan. Projects in a Plan and TIP that have been approved by the Federal Highway Administration (FHWA) are considered to have met the conformity requirement for regional emissions analysis.

The currently approved RTP and TIP is the 2004 RTP and the 2006 RTIP. The 2004 RTP was adopted by SCAG on April 1, 2004 as Resolution #04-451-2. FHWA approved the 2004 Plan on June 7, 2004.. The 2006 RTIP was adopted by SCAG on **Month day**, 2006 as Resolution #**XXX**. FHWA approved the 2006 RTIP on **Month day**, 2006. **[see discussion at beginning of Section 5.2-Report will need to be finalized upon approval of the RTIP by SCAG and FHWA]**

In order to obtain FHWA approval of the Plan and TIP as conforming, the following tests, demonstrating affirmative findings with respect to the Transportation Conformity Rule, were applied to the 2004 RTP.

- ♦ Regional Emissions Analysis (Sections 93.109, 93.110, 93.118, and 93.119)
- ♦ Timely Implementation of TCMs Analysis (Section 93.113)
- ♦ Financial Constraint Analysis (Section 93.108)
- ♦ Interagency Consultation and Public Involvement Analysis (Sections 93.105 and 93.112)

Likewise, the approval of the 2006 RTIP was contingent upon satisfying all relevant CFR sections applicable:

- ♦ Consistency with SCAG's 2004 RTP (Section 450.324 of the US DOT-Metropolitan Planning Regulations)

- Regional Emissions Analysis (Sections 93.109, 93.118, and 93.119)
- Timely Implementation of TCMs Analysis (Section 93.113)
- Financial Constraint Analysis (Section 93.108)
- Interagency Consultation and Public Involvement Analysis (Sections 93.105 and 93.112)

5.2 Project Inclusion in Approved RTP & RTIP

[The project is currently in the approved 2004 RTIP as an auxiliary lane addition and was included in the regional model as an auxiliary lane addition. It has been concluded that the project should be defined as a lane addition. The project definition has been updated in the 2006 RTIP which is currently in the public review process and is expected to be approved by October 2006. The following text assumes that the 2006 RTIP is approved and is based on the Draft 2006 RTIP. This report will not be finalized until the 2006 RTIP is approved. The text will need to be checked to ensure it is consistent with the 2006 RTIP]

The proposed project is included in the FHWA approved 2006 RTIP and referenced in the Plan. It is listed in Section II of Volume II of the 2006 RTIP, state highway section, Orange County. The following project information is excerpted from the 2006 RTIP:

- Lead Agency –Orange County Trans. Authority (OCTA)
- Project ID # - ORA120336
- Air Basin - SCAB
- Model # - 0312
- Program Code – CAR63
- Route – 91
- Begin Post Mile –25.6
- End Post Mile – 34.0
- Description – SR91 – Eastbound lane addition between SR241 & SR71 and improve NB SR71 Connector from SR91 –to Std. one Lane and shoulder width.

As previously mentioned, the MPO performs the regional analysis as part of the submitted Plan and TIP. The regional analysis requirement is deemed satisfied and conforming to the Transportation Conformity Rule upon FHWA approval of the Plan and TIP. Projects in the approved TIP and Plan meet the regional analysis criterion by reference to the two documents.

5.3 Results of Regional Emissions Analysis

The intent and purpose of the Transportation Conformity Rule is to satisfy the federal Clean Air Act Amendments of 1990. This requires that projects do not cause new violation relating to NAAQS, increase the severity of such violation, and delay the attainment of NAAQS. The 2004 RTIP and 2006 RTIP satisfy these objectives by incorporating the applicable state implementation plan (SIP) which contain the applicable tests for regional emissions analysis.

To achieve the stated goals, the regional emissions analysis is categorized into several tests: the emissions budget test or the emissions reduction test. For the budget test, the regional emissions must be equal or less than the emissions budgets. A budget test is used if and only if there is a submitted (with affirmative adequacy determination) or approved state implementation plan (SIP) for the criteria pollutant. Currently, there is an approved 2003 PM_{10} SIP (Attainment Plans), and an approved 1997 Nitrogen Dioxide SIP (Maintenance Plan). There is a submitted 2003 1-hour Ozone and CO SIP but these plans have yet to be approved by the EPA. However, the emissions budgets in the PM_{10}, Ozone and CO SIP have been approved by the EPA. Therefore, the budget test is used for all of these pollutants and is performed in the 2006 RTIP. EMFAC2002 was used to model vehicular pollutant emissions for the test. Table 5 presents the results of the budget test from the 2006 RTIP.

The regional $PM_{2.5}$ conformity determination uses a interim emissions test known as "less than baseline year" is performed. For a positive conformity finding, it must be demonstrated that implementing the 2004 RTP and 2006 RTIP will not increase emissions of $PM_{2.5}$ in future years above the baseline year of 2004. The results of this analysis are also shown in Table 5.

For criteria pollutants with an approved SIP, regional emissions are compared to budgets. Usually, the budget, the maximum allowed emission of a pollutant, decreases for future years until a reference year is attained. After this attainment year, the budget remains relatively constant with little or no further future rate of decrease. This budget at the attainment year corresponds to the ambient concentration of the criteria pollutant at NAAQS level. Alternatively, the intent in decreasing the budget is to reduce to ambient concentration of a criteria pollutant to the level delineated in the NAAQS, the essence of the Clean Air Act Amendments of 1990. Until a criteria pollutant concentration is reduced to that required in NAAQS, the pollutant is considered to be in non-attainment.

Table 5
Results of 2006 RTIP Regional Emissions Analyses

Ozone Emissions Analysis (tons/day)
SCAB – Summer Temperatures

Ozone Precursors		2008	2010	2020	2030
ROG (VOC)	Budget	216.000	155.000	155.000	155.000
	2006 RTIP	214.080	152.121	107.647	73.197
NO_x	Budget	464.000	352.000	352.000	352.000
	2006 RTIP	450.977	349.956	184.629	120.879

Nitrogen Dioxide (NO_2) Emissions Analysis (tons/day)
SCAB – Winter Temperatures

NO_2 Precursors		2010	2020	2030
NO_x	Budget	686.000	686.000	686.000
	2006 RTIP	449.597	206.008	133.040

Carbon Monoxide (CO) Emissions Analysis (tons/day)
SCAB – Winter Temperatures

		2010	2020	2030
CO	Budget	3,361.00	3,361.00	3,361.00
	2006 RTIP	1,817.970	863.514	530.35

Particulate Matter (PM_{10}) Emissions Analysis (tons/day)
SCAB – Annual Average Temperatures

PM_{10} Precursors		2008	2010	2020	2030
ROG (VOC)	Budget	251.000	251.000	251.000	251.000
	2006 RTIP	247.050	189.846	106.938	72.544
NO_x	Budget	549.000	549.000	549.000	549.000
	2006 RTIP	537.148	418.736	193.129	125.787
Primary	Budget	166.000	166.000	1666.000	166.000
(PM_{10})	2006 RTIP	158.972	155.823	151.893	152.274

Particulate Matter ($PM_{2.5}$) Emissions Analysis (tons/day)

$PM_{2.5}$ Precursors		2010	2020	2030
NO_x	Base Year Emissions	714.11	714.11	714.11
	2006 RTIP	418.74	193.13	125.79
Primary	Base Year Emissions	13.27	13.27	13.27
($PM_{2.5}$)	2006 RTIP	12.53	12.10	12.71

Particulate Matter ($PM_{2.5}$) Annual Emissions Analysis (tons/year)

$PM_{2.5}$ Precursors		2010	2020	2030
NO_x	Base Year Emissions	260,650	260,650	260,650
	2006 RTIP	152,839	70,492	45,912
Primary	Base Year Emissions	4,844	4,844	4,844
($PM_{2.5}$)	2006 RTIP	4,573	4,417	4,639

Source: 2006 RTIP

The goal of a SIP is to secure an attainment designation for the criteria pollutant at a future year. As such, a SIP is created if a pollutant is above NAAQS level; it is in non-attainment. Of the six criteria pollutants, two are in attainment: lead and sulfur dioxide. The remaining pollutants have its respective SIP to address attainment for future years. Table 6 lists the non-attainment designations per state and federal (NAAQS) standards. The attainment date for the federal standards is also shown.

Table 6
Designations of Criteria Pollutants for the SCAB

Pollutant	Federal	State
O_3 (1-hr)	Extreme Non-attainment (2010)	Non-attainment
O_3 (8-hr)	Severe-17 Non-attainment (2021)	Non-attainment
NO_2	Attainment/Maintenance (1995)	Attainment
CO	Serious Non-attainment (2000)	Attainment
PM_{10}	Serious Non-attainment (2006)	Non-attainment
$PM_{2.5}$	Non-attainment (2015)	Non-attainment

5.4 Construction-Related Emissions

Construction activities associated with the proposed project would be temporary and would last the duration of Project construction. A qualitative construction emissions analysis has concluded that Project construction would not create adverse pollutant emissions. Short-term impacts to air quality would occur during minor grading/trenching, new pavement construction and the re-striping phase. Additional sources of construction related emissions include:

- Exhaust emissions and potential odors from construction equipment used on the construction site as well as the vehicles used to transport materials to and from the site; and

- Exhaust emissions from the motor vehicles of the construction crew.

Project construction would result in temporary emissions CO, NO_x, ROG, and PM_{10}. Stationary or mobile powered on-site construction equipment includes trucks, tractors, signal boards, excavators, backhoes, concrete saws, crushing and/or processing equipment, graders, trenchers, pavers and other paving equipment. Based on the insignificant amount of daily work trips required for Project construction, construction worker trips are not anticipated to significantly contribute to or affect traffic flow on local roadways and are therefore not considered significant.

During the demolition phase some asphalt concrete (AC) pavement and curbs and gutters would have to be removed.

In order to further minimize construction-related emissions, all construction vehicles and construction equipment would be required to be equipped with the state-mandated emission control devices pursuant to state emission regulations and standard construction practices. After construction of the Project is complete, all construction-related impacts would cease, thus resulting in a less than significant impact. Short-term construction PM_{10} emissions would be further reduced with the implementation of required dust suppression measures outlined within SCAQMD Rule 403 presented in Section 5.5. Note that Caltrans Standard Specifications for construction (Section 10 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plants]) must also be adhered to. Therefore, Project construction is not anticipated to violate State or Federal air quality standards or contribute to the existing air quality violation in the air basin.

Section 93.122(d)(2) of the EPA Transportation Conformity Rule requires that in PM_{10} non-attainment and maintenance areas (for which the SIPs identify construction-related fugitive dust as a contributor to the area problem), the RTIP should conduct the construction-related fugitive PM_{10} emission analysis. The 2003 PM_{10} SIP/AQMP emissions budgets for SCAB include the construction and unpaved-road emissions. The 2006 RTIP PM_{10} regional emissions analysis includes the construction and unpaved road emissions for conformity finding.

5.5 Mitigation of PM_{10} During Construction

The approved 2003 Particulate Matter SIP contains provisions calling for mitigation of PM_{10} emissions during construction. Pursuant § 93.117, the Department, the project sponsor, is required to stipulate to include, in its final plans, specification, and estimates, control measures that will limit the emission of PM_{10} during construction. Such control plans must be contained in an applicable SIP.

The PM_{10} emissions is a composite of geologic and aerosol variety. The prime concern during construction is to mitigate geologic PM_{10} that occurs from earth movement such as grading. The agency who sponsored the PM_{10} SIP is SCAQMD with concurrence from the California Air Resource Board. SCAQMD has established Rule 403 that addresses the mitigation PM_{10} by reducing the ambient entrainment of fugitive dust and Rule 402 which requires that air pollutant emissions not be a nuisance off-site. Fugitive dust consists of solid particulate matters that becomes airborne due to human activity (i.e. construction) and is a subset of total suspended particulates. Likewise, PM_{10} is a subset of total suspended particulates. The Handbook states that 50% of total particulate matter suspended comprise of PM_{10}. Hence, in mitigating for fugitive dust, emissions of geologic PM_{10} are reduced.

During construction of the proposed project, the property owner/development and its contractors shall be required to comply with regional rules, which shall assist in reducing short-term air pollutant emissions. SCAQMD Rule 402 requires that air pollutant emissions not be a nuisance off-site. SCAQMD Rule 403 requires that fugitive dust be controlled with the best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Two options are presented in Rule 403: monitoring of particulate concentrations or active control. Monitoring involves a sampling network around the project with no additional control measures unless specified concentrations are exceeded. The active control option does not require any monitoring, but requires that a list of measures be implemented starting with the first day of construction.

Rule 403 requires that "No person conducting active operations without utilizing the applicable best available control measures included in Table 1 of this Rule to minimize Fugitive dust emissions from each fugitive dust source type within the active operation." The measures from Table 1 of Rule 403 are presented in Table 7 of this report. The applicable measures presented in Table 1 are required to be implemented by Rule 403.

Rule 403 requires that "Large Projects" implement additional measures. A Large Project is defined as "any active operations on property which contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 3,850 cubic meters (5,000 cubic yards) or more three times during the most recent 365 day period. Depending on the scheduling of grading of the project may be considered a Large Project under Rule 403. Therefore, the project will be required to implement the applicable actions specified in Table 2 of the Rule. Table 2 from Rule 403 is presented in Table 8 of this report. As a Large Operation, the project would also be required to:

- Submit a fully executed Large Operation Notification (SCAQMD Form 403N) to the SCAQMD Executive Officer within 7 days of qualifying as a large operation;
- Include, as part of the notification, the name(s), address(es), and phone number(s) of the person(s) responsible for the submittal, and a description of the operation(s), including a map depicting the location of the site;
- Maintain daily records to document the specific dust control actions taken, maintain such records for a period of not less than three years; and make such records available to the Executive Officer upon request.
- Install and maintain project signage with project contact signage that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earthmoving activities.
- Identify a dust control supervisor that is employed by or contracted with the property owner/developer, is on the site or available on-site within 30 minutes during working hours, has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements, and has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class.
- Notify the SCAQMD Executive Officer in writing within 30 days after the site no longer qualifies as a large operation.

Rule 403 also requires that the construction activities "shall not cause or allow PM_{10} levels exceed 50 micrograms per cubic meter when determined by simultaneous sampling, as the difference between upwind and down wind sample." Large Projects that cannot meet this performance standard are required to implement the applicable actions specified in Table 3 of Rule 403. Table 3 from Rule 403 is presented in Table 9 of this report. Rather than perform monitoring to determine conformance with the performance standard, which will not reduce PM_{10} emissions, the project shall implement all applicable measures presented in Rule 403 Table

3 regardless of conformance with the Rule 403 performance standard. This potentially results in a higher reduction of particulate emissions than if these measures were implemented only after being determined to be required by monitoring.

Further, Rule 403 requires that that the project shall not "allow track-out to extend 25 feet or more in cumulative length from the point of origin from an active operation." All track-out from an active operation is required to be removed at the conclusion of each workday or evening shift. Any active operation with a disturbed surface area of five or more acres or with a daily import or export of 100 cubic yards or more of bulk materials must utilize at least one of the measures listed in Table 10 at each vehicle egress from the site to a paved public road.

All measures presented in Table 7 through Table 10 applicable to the construction activities associated with the project should be implemented to the greatest extent feasible.

Table 7
Required Best Available Control Measures (Rule 403 Table 1)

Source Category	Control Measure	Guidance
Backfilling		
01-1	Stabilize backfill material when not actively handling; and	• Mix backfill soil with water prior to moving
01-2	Stabilize backfill material during handling; and	• Dedicate water truck or high capacity hose to backfilling equipment
01-3	Stabilize soil at completion of activity.	• Empty loader bucket slowly so that no dust plumes are generated • Minimize drop height from loader bucket
Clearing and Grubbing		
02-1	Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and	• Maintain live perennial vegetation where possible • Apply water in sufficient quantity to prevent generation of dust plumes
02-2	Stabilize soil during clearing and grubbing activities; and	
02-3	Stabilize soil immediately after clearing and grubbing activities.	
Clearing Forms		
03-1	Use water spray to clear forms; or	• Use of high pressure air to clear forms may cause exceedance of Rule requirements
03-2	Use sweeping and water spray to clear forms; or	
03-3	Use vacuum system to clear forms.	

Table 7 (Continued)
Required Best Available Control Measures (Rule 403 Table 1)

Source Category	Control Measure	Guidance
Crushing		
04-1	Stabilize surface soils prior to operation of support equipment; and	• Follow permit conditions for crushing equipment
04-2	Stabilize material after crushing.	• Pre-water material prior to loading into crusher • Monitor crusher emissions opacity • Apply water to crushed material to prevent dust plumes
Cut and Fill		
05-1	Pre-water soils prior to cut and fill activities; and	• For large sites, pre-water with sprinklers or water trucks and allow time for penetration
05-2	Stabilize soil during and after cut and fill activities.	• Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts
Demolition – Mechanical/Manual		
06-1	Stabilize wind erodible surfaces to reduce dust; and	• Apply water in sufficient quantities to prevent the generation of visible dust plumes
06-2	Stabilize surface soil where support equipment and vehicles will operate; and	
06-3	Stabilize loose soil and demolition debris; and	
06-4	Comply with AQMD Rule 1403.	
Disturbed Soil		
07-1	Stabilize disturbed soil throughout the construction site; and	• Limit vehicular traffic and disturbances on soils where possible
07-02	Stabilize disturbed soil between structures	• If interior block walls are planned, install as early as possible • Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Earth-Moving Activities		
08-1	Pre-apply water to depth of proposed cuts; and	• Grade each project phase separately, timed to coincide with construction phase
08-2	Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and	• Upwind fencing can prevent material movement on site • Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
08-3	Stabilize soils once earth-moving activities are complete.	

Table 7 (Continued)
Required Best Available Control Measures (Rule 403 Table 1)

Source Category / Control Measure		Guidance
Importing/Exporting of Bulk Materials		
09-1	Stabilize material while loading to reduce fugitive dust emissions; and	• Use tarps or other suitable enclosures on haul trucks
09-2	Maintain at least six inches of freeboard on haul vehicles; and	• Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage
09-3	Stabilize material while transporting to reduce fugitive dust emissions; and	• Comply with track-out prevention/mitigation requirements
09-4	Stabilize material while unloading to reduce fugitive dust emissions; and	• Provide water while loading and unloading to reduce visible dust plumes
09-5	Comply with Vehicle Code Section 23114.	
Landscaping		
10-1	Stabilize soils, materials, slopes	• Apply water to materials to stabilize Maintain materials in a crusted condition • Maintain effective cover over materials • Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes • Hydroseed prior to rain season
Road Shoulder Maintenance		
11-1	Apply water to unpaved shoulders prior to clearing; and	• Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs
11-2	Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	• Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs
Screening		
12-1	Pre-water material prior to screening; and	• Dedicate water truck or high capacity hose to screening operation
12-2	Limit fugitive dust emissions to opacity and plume length standards; and	• Drop material through the screen slowly and minimize drop height
12-3	Stabilize material immediately after screening.	• Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point
Staging Areas		
13-1	Stabilize staging areas during use; and	• Limit size of staging area
13-2	Stabilize staging area soils at project completion.	• Limit vehicle speeds to 15 miles per hour • Limit number and size of staging area entrances/exists

Table 7 (Continued)
Required Best Available Control Measures (Rule 403 Table 1)

Source Category / Control Measure	Guidance
Stockpiles/ Bulk Material Handling	
14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	• Add or remove material from the downwind portion of the storage pile • Maintain storage piles to avoid steep sides or faces
Traffic Areas for Construction Activities	
15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	• Apply gravel/paving to all haul routes as soon as possible to all future roadway areas • Barriers can be used to ensure vehicles are only used on established parking areas/haul routes
Trenching	
16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16.2 Stabilize soils at the completion of trenching activities.	• Pre-watering of soils prior to trenching is an effective preventive measure. • For deep trenching activities, pre-trench to 18 inches, soak soils via the pre-trench, and resume trenching • Washing mud and soils from equipment at the conclusion of trenching activities to prevent crusting and drying of soil on equipment
Truck Loading	
17-1 Pre-water material prior to loading; and 17.2 Ensure that freeboard exceeds six inches (CVC 23114)	• Empty loader bucket such that no visible dust plumes are created • Ensure that the loader bucket is close to the truck to minimize drop height while loading
Turf Overseeding	
18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	• Haul waste material immediately off-site

Table 7 (Continued)
Required Best Available Control Measures (Rule 403 Table 1)

Source Category / Control Measure		Guidance
Unpaved Roads/Parking Lots		
19-1	Stabilize soils to meet the applicable performance standards; and	• Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
19-2	Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	
Vacant Land		
20-1	In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	

Table 8
Dust Control Measures for Large Operations (Rule 403 Table 2)

Fugitive Dust Source Category Control Actions
Earth-moving (except construction cutting and filling areas, and mining operations)
(1a) Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR
(1a-1) For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas:
(1b) Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.
Earth-moving: Construction cut areas and mining operations:
(1c) Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)
(2a/b) Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas
(2c) Apply chemical stabilizers within five working days of grading completion; OR
(2d) Take actions (3a) or (3c) specified for inactive disturbed surface areas.

Table 8 (Continued)
Dust Control Measures for Large Operations (Rule 403 Table 2)

Fugitive Dust Source Category	Control Actions
Inactive disturbed surface areas	
(3a)	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
(3b)	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
(3c)	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
(3d)	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved Roads	
(4a)	Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; OR
(4b)	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR
(4c)	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	
(5a)	Apply chemical stabilizers; OR
(5b)	Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR
(5c)	Install temporary coverings; OR
(5d)	Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities.
All Categories	
(6a)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 2 may be used.

Table 9
Contingency Control Measures for Large Operations (Rule 403 Table 3)

Fugitive Dust Source Category	Control Actions
Earth-moving	
(1A)	Cease all active operations; OR
(2A)	Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	
(0B)	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR
(1B)	Apply chemical stabilizers prior to wind event; OR
(2B)	Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR
(3B)	Take the actions specified in Table 2, Item (3c); OR
(4B)	Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved Roads	
(1C)	Apply chemical stabilizers prior to wind event; OR
(2C)	Apply water twice per hour during active operation; OR
(3C)	Stop all vehicular traffic.
Open Storage Piles	
(1D)	Apply water twice per hour; OR
(2D)	Install temporary coverings.
Paved Road Track-Out	
(1E)	Cover all haul vehicles; OR
(2E)	Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	
(1F)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

Table 10
Track Out Control Options

(A)	Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 20 feet wide and 50 feet long.
(B)	Pave the surface extending at least 100 feet and a width of at least 20 feet wide.
(C)	Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipe, or grates) at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle under carriages before vehicles exit the site.
(D)	Install and utilize a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.
(E)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified items (A) through (D) above.

6.0 Local Air Quality Analysis

6.1 Overview of Local Analysis

The local analysis is commonly referred to as project level air quality or "hot spot" analysis. The primary focus is the operational impact on air quality created by the proposed improvement. Unlike a regional analysis, a local analysis is constrained in scope and is limited to a particular project. The criteria pollutants analyzed do not consist of all pollutants in non-attainment. The analysis is restricted to carbon monoxide, PM_{10}, and $PM_{2.5}$. The analysis years consist of the year opening to traffic and the ultimate horizon year referenced in the approved Plan rather than a series of present and future years. The approach to the local analysis is tiered and is dependent on the status of the carbon monoxide SIP: the CO analysis can be qualitative, quantitative, or computational. The PM_{10} and $PM_{2.5}$ analyses is qualitative in scope.

Similar to the regional analysis, the Transportation Conformity Rule also applies to the local analysis. Sections of pertinence are 40 CFR 93.115 to 93.117, 93.123,and 93.126 to 93.128. In California, the procedures of the local analysis for carbon monoxide are modified pursuant §93.123(a)(1). Sub-paragraph (a)(1) states the following:

> *CO hot-spot analysis*. (1) The demonstrations required by §93.116 ("Localized CO and PM_{10} violations") must be based on a quantitative analysis using the applicable air quality models, data bases, and other requirements specified in 40 CFR part 51, Appendix W (Guideline on Air Quality Models). These procedures shall be used in the following cases, unless different procedures developed through the interagency consultation process required in §93.105 and approved by the EPA Regional Administrator are used:

The sub-paragraph allows for an alternative. In California, the procedure for performing a CO analysis is detailed in the Transportation Project-Level Carbon Monoxide Protocol (Protocol) developed by the Institute of Transportation Studies at the University of California, Davis. David P. Howekamp, Director of Air Division of the US EPA Region IX, in October of 1997, approved the Protocol. The US EPA deemed the Protocol as an acceptable option to the mandated quantitative analysis. The Protocol incorporates §93.115 – 93.117, §93.126 – 93.128 into its rules and procedures.

§93.123(b)(1) requires that the PM_{10}, and $PM_{2.5}$ analysis be quantitative. However, §93.123(b)(4) waives such analysis until the EPA releases modeling guidance and announces such guidance in the Federal Register. Since no modeling guidance has been released to date, §93.123(b)(4) offsets the implementation of §93.123(b)(1) and only a qualitative analysis is required.

On September 2001, the FHWA released guidance, to its field offices, titled Guidance for Qualitative Project Level "Hot Spot" Analysis in PM_{10} Non-attainment and Maintenance Areas. The document attempts to fill the gap in understanding the type of analysis required. It provides examples on how to develop a hot spot analysis and the guidance allows for other methods as well. In California, the Department in association with the University of California at Davis has developed guidance titled Particulate Matter and Transportation Projects, an Analysis Protocol which formalizes the FHWA guidance and provides a step-by-step flow chart to assess PM_{10}

hotspot impacts. The analysis approaches detailed in the PM Protocol document provide project analysts with several tools likely to be of assistance once EPA issues its final PM hot spot regulations.

On March 10, 2006, the EPA released guidance on PM_{10}, and $PM_{2.5}$ analyses, titled Transportation Conformity Guidance for Qualitative Hot-spot Analysis in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas. This guidance supercedes the FHWA and Caltrans PM_{10} guidance discussed above, however, the new guidance allows that if an analysis using the previous guidance was started before the release of the new guidance, the previous guidance could be used. The analysis for PM_{10} for this project was begun in November 2005 and a draft was submitted on March 6, 2006 under the previous guidance and is presented in Section 6.3. The appendix presents an e-mail path showing that the analysis was completed prior to March 10, 2006. The analysis for $PM_{2.5}$ hotspots was performed under the March 2006 EPA Guidance and is presented in Section 6.4.

6.2 Local Analysis: Carbon Monoxide Operational Impact

The scope required for local analysis is summarized in Section 3, Determination of Project Requirements, and Section 4, Local Analysis, of the Protocol. Section 3 incorporates §93.115 and the procedure to determine project requirements begins with the Figure 1: Requirements for New Projects. The sections cited is followed by a response, which will determine the next applicable section of the flowchart for the proposed project. The flowchart begins with Section 3.1.1. Exhibit 3 and Exhibit 4 show the flowchart from Figure 1 of the protocol and the path taken.

Q: 3.1.1. Is this project exempt from all emissions analyses? (see Table 1)

A: No. Table 1 of the Protocol is Table 2 of §93.126. Section 3.1.1 is inquiring if the project is exempt. Such projects appear in Table 1 of the Protocol. The proposed project does not appear in Table 1. It is not exempt from all emissions analyses.

Q: 3.1.2. Is project exempt from regional emissions analyses? (see Table 2)

A: No. Table 2 of the Protocol is Table 3 of §93.127. The question is attempting to determine if project is listed in Table 2. The project is not listed in Table 2 and is not exempt from regional analyses.

Q: 3.1.3. Is the project locally defined as regionally significant?

A: Yes. Projects not listed in Table 1 nor 2 of the Protocol are usually considered regionally significant unless otherwise stipulated via interagency consultation. The project is considered as regionally significant.

Q: 3.1.4. Is project in a federal attainment area?

A: No. As shown in Table 6 of this report, the Basin is in non-attainment for CO per federal designation.

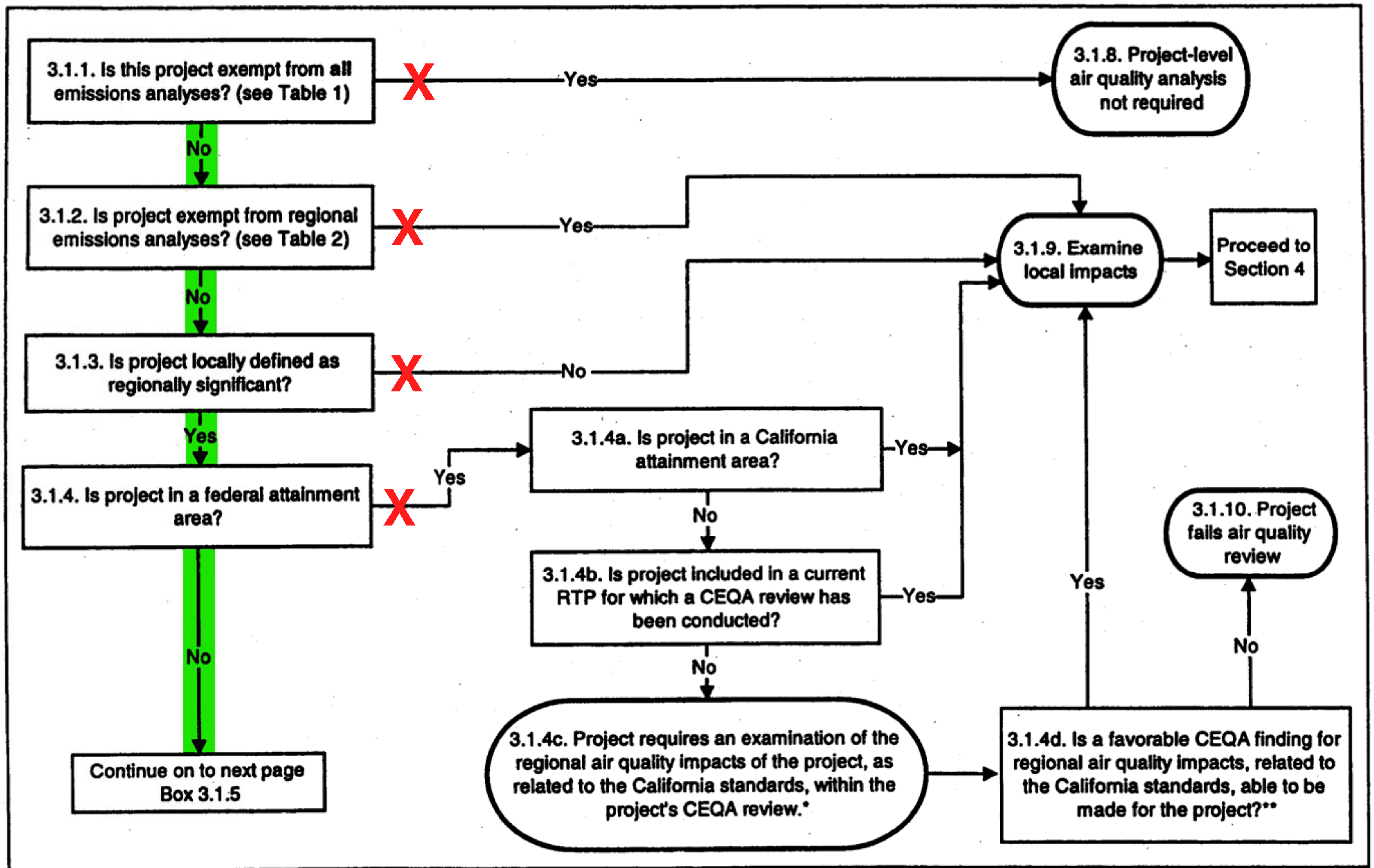


Figure 1. Requirements for New Projects

Exhibit 3
Caltrans CO Protocol Figure 1 - Part 1

Mestre Greve Associates

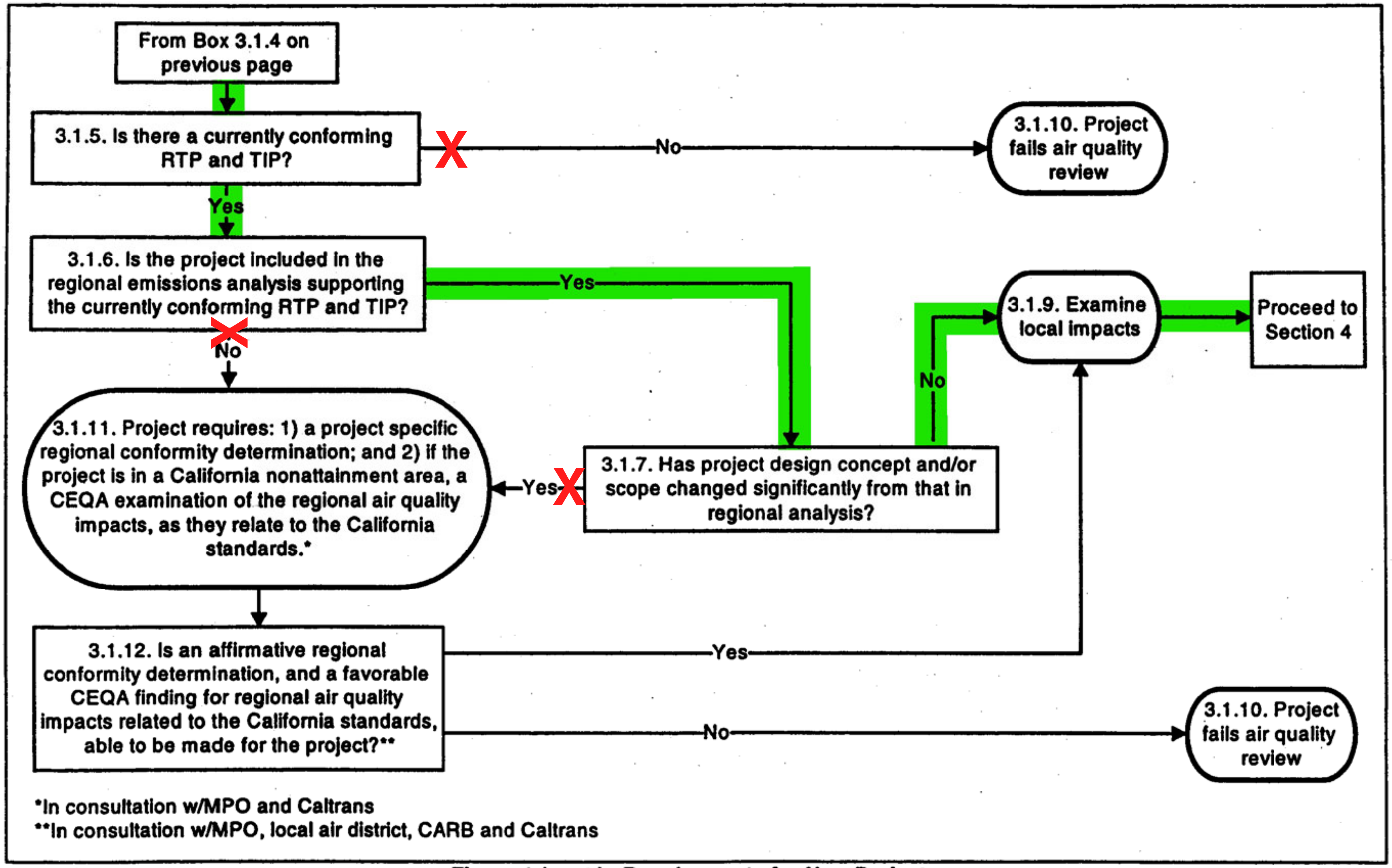


Figure 1 (cont.). Requirements for New Projects

Exhibit 4
Caltrans CO Protocol Figure 1 - Part 2

Q: 3.1.5. Is there a currently conforming RTP and TIP?

A: Yes, the most recently FHWA approved Plan and TIP is the 2004 Regional Transportation Plan and the 2006 Regional Transportation Improvement Program.

Q: 3.1.6. Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?

A: Yes, this project is in the FHWA approved 2004 Regional Transportation Plan and the 2006 Regional Transportation Improvement Program and therefore, does meet regional conformity.

Q: 3.1.7. Has project design concept and/or scope changed significantly from that in regional analysis?

A: No, the project has not changed significantly with regards to scope and design concept.

Q: 3.1.9. Examine local impacts.

A: Section 3.1.9 of the flowchart directs the project evaluation to Section 4, Local Analysis, of the Protocol. This concludes the flow chart presented in Figure 1 of the Protocol

Likewise, Section 4 contains a Local CO Analysis flowchart presented in Figure 3. This flowchart is used to determine the type of CO analysis required for the proposed project. Below is a step by step explanation of the flowchart. Each level cited is followed by a response, which will determine the next applicable level of the flowchart for the proposed project. The flowchart begins at level 1. Exhibit 5 and Exhibit 6 show the flowchart from Figure 3 of the protocol and the path taken.

Q: Level 1. Is the project in a CO non-attainment area?

A: Yes, as shown in Table 6, the Basin is currently classified as non-attainment for CO.

Q: Level 2. Is the project in an area with an approved CO attainment or maintenance plan?

A: No, while the 2003 SCAQMD Air Quality Management Plan contains a CO attainment plan it has not yet been approved by the EPA. The 1997 SCAQMD Air Quality Management Plan had a CO attainment plan which was approved by the EPA. However, this was only an interim approval that expired in 1998. Therefore, at the present time there is no approved CO attainment or maintenance plan for the South Coast Air Basin. Therefore. the flow chart is continued to Level 3.

Q: Level 3. Is the project in an area with a submitted CO attainment or maintenance plan?

A: Yes. The Basin has a submitted CO attainment plan.

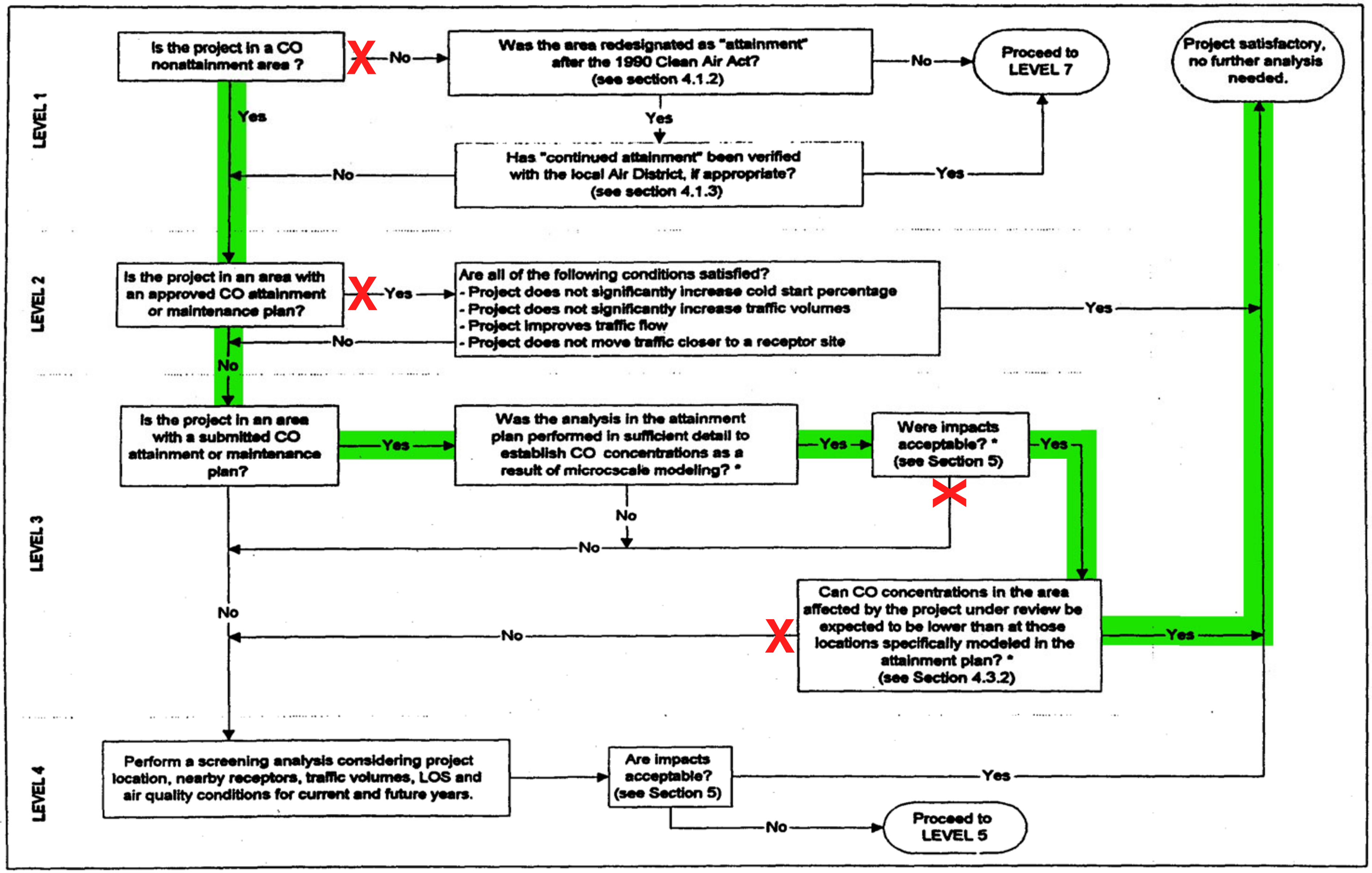


Figure 3. Local CO Analysis

Exhibit 5
Caltrans CO Protocol Figure 3 - Part 1

Mestre Greve Associates

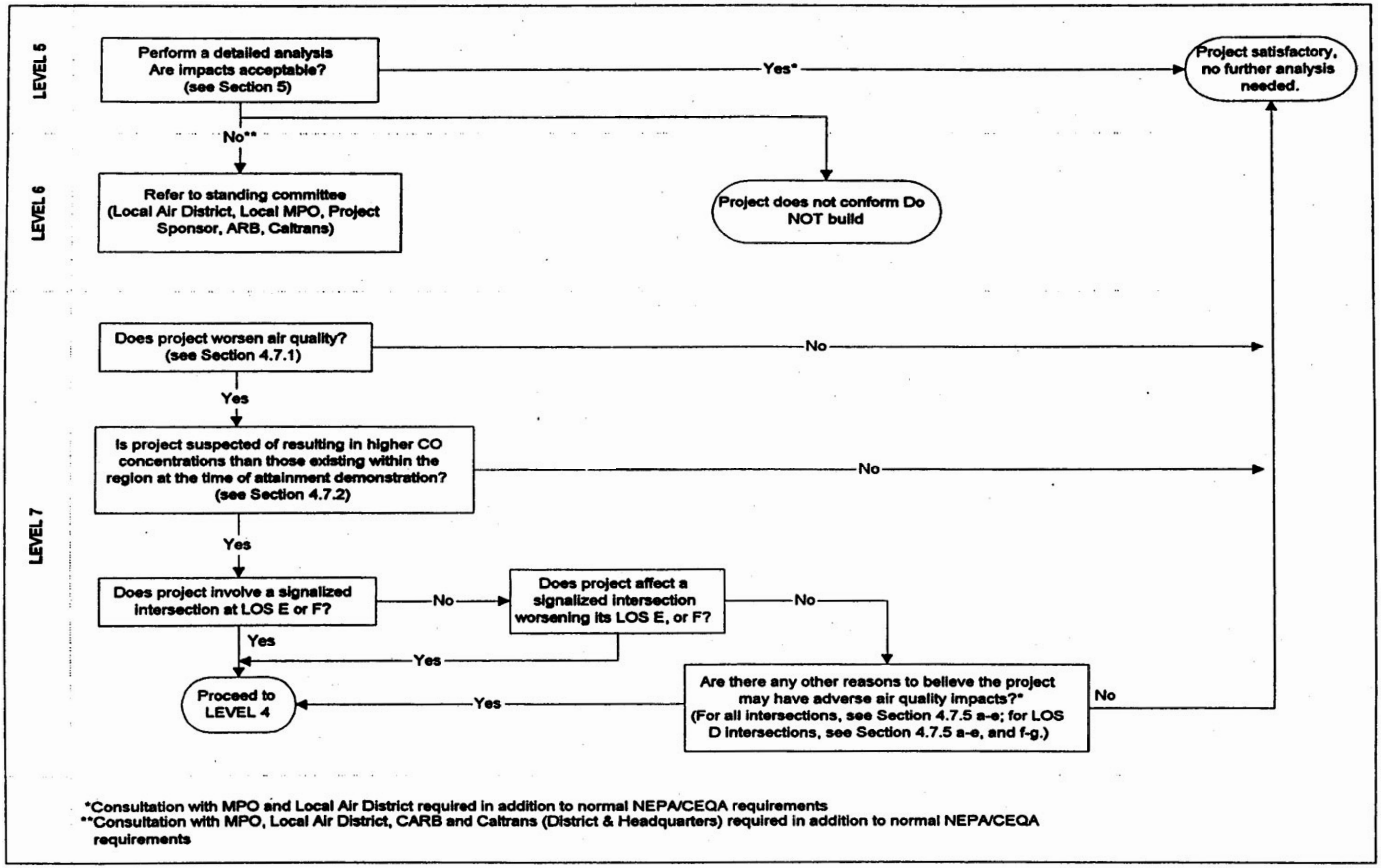


Figure 3 (cont.). Local CO Analysis

Exhibit 6
Caltrans CO Protocol Figure 3 - Part 2

Q: Level 3. Was the analysis in the attainment plan performed in sufficient detail to establish CO concentrations as a result of micro-scale modeling?

A: Yes, the analysis does establish CO concentrations as a result of micro-scale modeling. The results of the modeling are presented in Chapter 4 of Appendix V of the 2003 AQMP.

Q: Level 3. Were impacts acceptable? (see Section 5)

A: Yes. Section 5 of the Protocol presents the national and state ambient air quality standards for CO. The impacts in the CO modeling for the 2003 AQMP at year 2002 are less than the threshold of 20 ppm for 1-hr CO. In fact, the 1-hour concentrations are less than 8-hr CO standard of 9.0 ppm. A summary is provided below:

Table 11
Year 2002 1-Hour Average Carbon Monoxide Concentrations

Location	Morning[1]	Afternoon[2]	Peak[3]
Wilshire-Veteran	4.6 ppm	3.5 ppm	---
Sunset-Highland	4.0 ppm	4.5 ppm	---
La Cienega-Century	3.7 ppm	3.1 ppm	---
Long Beach-Imperial	3.0 ppm	3.1 ppm	1.2 ppm

1. Morning : 7-8 a.m. for, La Cienega - Century, 8-9 a.m. for Wilshire - Veteran, 7-8 a.m. for Long Beach - Imperial, and 8-9 a.m. for Sunset – Highland
2. Afternoon : 3-4 p.m. for Sunset - Highland, 5-6 p.m. for Wilshire - Veteran, 4-5 p.m. and Long Beach - Imperial, and. 6-7 p.m. for and La Cienega – Century
3. Peak : 11-12 p.m. (concentration at the hour of the observed peak)). Peak is only provided for the Long Beach/Imperial intersection since it is intersection associated with the regional peak at Lynwood.

Source: Table 4-10, Final 2003 AQMP Appendix V. Modeling and Attainment Demonstration, SCAQMD.

Q: Level 3. Can CO concentrations in the area affected by the project under review be expected to be lower than at those locations specifically modeled in the attainment plan? (see Section 4.3.2)

A: Yes. CO concentrations at the controlled intersections most affected by the project would be expected to be less than those modeled in the attainment plan.

The lowest emission rates for CO typically occur at cruising speeds where freeway driving occurs. As cars accelerate from an idle position cruise position CO emission rates for CO increase. This usually occurs in the vicinity of controlled intersections. Therefore, CO concentrations are the highest near controlled intersections due to idling during queuing. Therefore, the highest CO concentrations affected by the project will occur near the controlled intersection with the greatest traffic volume that is affected by the project. CO concentrations along the mainline SR-91 would be expected to lower than near this intersection.

When qualitatively comparing the locations in the attainment plan to the proposed project, several factors are considered to determine if the site of the project can be expected to have lower CO concentrations than in the attainment plan. The factors considered are traffic demand, emission variables, site variables, and meteorological variables. A prevailing factor in determining the CO impact is the traffic demand. More cars imply greater CO concentrations.

The traffic study prepared for the project by Meyer, Mohaddes Associates, Inc. Only presented traffic volumes along the eastbound SR-91 and the ramps within the project area connecting to the eastbound SR-91. Mr. Abi Mogharabi, the traffic engineer for the project, indicated that controlled intersection with the greatest traffic volume that is affected by the project would be the intersection of Green River Road at the SR-91 Ramps. Table 12 presents the peak hour traffic volumes for the SR-91 ramps at Green River Road from the traffic study prepared for the project.

Table 12
SR-91/Green River Road Ramp Peak Hour Traffic Volumes (AM/PM) from Traffic Study Prepared for Project

Ramp	2005	2030 No Project	2030 With Project
EB On-Ramp	225 / 1,890	290 / 2,360	290 / 2,400
EB Off Ramp	245 / 215	300 / 270	330 / 290

Source: Eastbound SR-91 Auxiliary Lane From SR-241 to SR-71 12-Ora-91 KP 25.629/32.034 8-Riv-91 KP 0.000/4.682 *Caltrans District 12 EA 0G040K Caltrans District 8 EA 0E800K* DRAFT Traffic Analysis Report for the Project Report (PR) and Environmental Document (ED),

In order to compare the volumes at the Green River Road/SR-91 ramp intersections volumes are needed for the Green River Road as well as the ramps. The most current data available for Green River Road and the ramps comes from the traffic data prepared for the SR-91 Green River Bridge Project. This data is presented in Table 13.

Table 13
Green River Road and SR-91 Ramp Peak Hour Traffic Volumes (AM/PM) from Traffic Study Prepared for Green River Bridge Project

Road	Peak Hour Volume (AM / PM) 2007	2025
EB On-Ramp	280 / 160	570 / 590
EB Off-Ramp	320 / 1,100	1,190 / 1,540
WB Off-Ramp	1,340 / 430	1,770 / 1,140
WB On-Ramp	170 / 390	680 / 620
Green River Road South Bound*	340 / 1,160	1,380 / 1,720
Green River Road North Bound*	1,200 / 390	1,790 / 1,440

*S.E. of Green River IC on Green River Road (STA 18+80)
Source: California Department of Transportation. Traffic Data on Peak Hour Volumes for SR-91 Green River Bridge Project. Forecasting/Traffic Analysis. September 8, 2003

Comparing the Ramp volumes in Table 12 and Table 13 shows some substantial differences in the traffic volumes. The future AM peak hour volumes on the EB on-ramp in the traffic study for this project are just more than half of the volume from the Green River Bridge Project traffic data. The PM Peak hour volume is almost for times greater in the traffic study for this project. The EB off-ramp peak hour volumes in the traffic study for this project are three to five times lower than reported for the Green River Drive project. Using the higher of the two volumes provides a worst-case estimate of the peak hour traffic volumes at the intersections. These volumes are presented in Table 14.

Table 14
Worst-Case Green River Road at SR-91 Ramp Peak Hour Traffic Volumes (AM/PM)

	Peak Hour Traffic Volumes (AM / PM)				
Intersection	**West Link**	**East Link**	**North Link**	**South Link**	**Total**
Green River - East Bound SR-91 Ramps	1,190 / 1,540	570 / 2,400	1,380 / 1,720	1,790 / 1,440	4,930 / 7,100
Green River - West Bound SR-91 Ramps	1,770 / 1,140	680 / 620	1,380 / 1,720	1,790 / 1,440	5,620 / 4,920

Source: Highest traffic volume from Table 12 and Table 13.

Table 15 presents the traffic volumes for the four intersections modeled in the CO Attainment Plan.

Table 15
Approach Traffic Volumes at Intersections Modeled in CO Attainment Demonstration

	Peak Hour Traffic Volumes (AM / PM)				
Intersection	**West Link**	**East Link**	**North Link**	**South Link**	**Total**
Wilshire-Veteran	4,951 / 2,069	1,830 / 3,317	721 / 1,400	560 / 933	8,062 / 7,719
Sunset-Highland	1,417 / 1,764	1,342 / 1,540	2,304 / 1,832	1,551 / 2,238	6,614 / 7,374
La Cienega-Century	2,540 / 2,243	1,890 / 2,728	1,384 / 2,029	821 / 1,674	6,635 / 8,674
Long Beach-Imperial	1,217 / 2,020	1,760 / 1,400	479 / 944	756 / 1,150	4,212 / 5,514

Note: The traffic count only included mainline. Does not include left and right turn movements
Source: Final 2003 AQMP Appendix V. Modeling and Attainment Demonstration, SCAQMD.

A comparison of the traffic volumes presented in Table 14 and Table 15 demonstrates that the intersections modeled in the attainment plan have substantially greater traffic count than at the proposed project site, and the left and right hand turn movements were not included in the comparison. If the movements were included, the traffic count at the four intersections would be an additional 500-1000+ vehicles at peak hour. The emission variables in the attainment plan model and the proposed project have been assumed as equivalent. The site variable, number of vehicle lanes, in the attainment plan consists of 4x4 intersection except at Long Beach-Imperial, it is a 3x3 intersection. The proposed project has eastbound and westbound on/off ramps (un-signalized intersections) at the Green River Bridge. Based on the comparison in the above table, the proposed project is expected to bear a CO impact substantially less than the four intersections modeled in the attainment plan.

Conclusion

In answering affirmative to all questions in level three of the CO Protocol Local Analysis flow Chart (Figure 3 of the protocol shown here in Exhibit 5 and Exhibit 6), the project has sufficiently addressed the CO impact and no further analysis is needed.

6.3 Local Analysis: PM_{10} Operational Impact

Table 6 of the report cites the SCAB with the status of serious non-attainment of the PM_{10} standard per federal designation. Projects located in areas with non-attainment designations are subjected to §93.123. As aforementioned, the PM_{10} analysis for this report is qualitative based on FHWA guidance and Caltrans PM Transportation Project Analysis Protocol. Figure 1 of the PM_{10} protocol presents a flowchart that describes the steps in the protocol. This flow chart is presented in Exhibit 7. The steps taken are highlighted. Each applicable analysis box question in the figure is answered below. The analysis starts in Chart 2, question F2.1 because the project is located in a PM_{10} non-attainment area

Q: F2.1 Is there an existing facility appropriate for comparison with the proposed project (must meet Table 2 Criteria)?

A: No, there are existing facilities with local PM_{10} monitoring that are appropriate for comparison with the proposed project. Therefore, per F2.4 the analysis is continued on Chart 3-Threshold Screening.

Q: F3.1 At the most representative monitor for the proposed project site, are 24-hr average concentrations expected to be <=80% of the 24-hr standard (120µg/m³)

A: Yes, Table 16 presents the four highest 24-hour average concentrations for the last three years of PM_{10} monitoring data for the nearest ambient air quality monitoring station, the Norco-Norconian station (CARB is not currently reporting complete data for 2005). The table shows that the 120 $\mu g/m^3$ threshold was approached once in 2003. However, this was during a period of intense wildfire activity in Southern California and is not representative of typical conditions. The next highest concentration is 79 $\mu g/m^3$, two-thirds of the threshold, which is representative of typical conditions. The data indicates a slight downward trend in concentrations that would be expected to continue in the future. Therefore, the project conforms to the 24-hour PM_{10} standard and the analysis is continued to the annual standard in Box F3.3.

Table 16
Norco-Norconian Site Four Highest 24-Hour Average PM_{10} Measurements ($\mu g/m^3$)

	2002		2003		2004	
	Date	Level	Date	Level	Date	Level
First High:	5-Oct	78	24-Oct	116	6-Sep	76
Second High:	7-Feb	77	5-Dec	79	22-Mar	72
Third High:	25-Feb	72	18-Oct	68	24-Sep	72
Fourth High:	4-Dec	71	2-Jul	67	31-Aug	70

Figure 1. Flowchart illustrating the step-by-step qualitative PM_{10} analysis protocol.

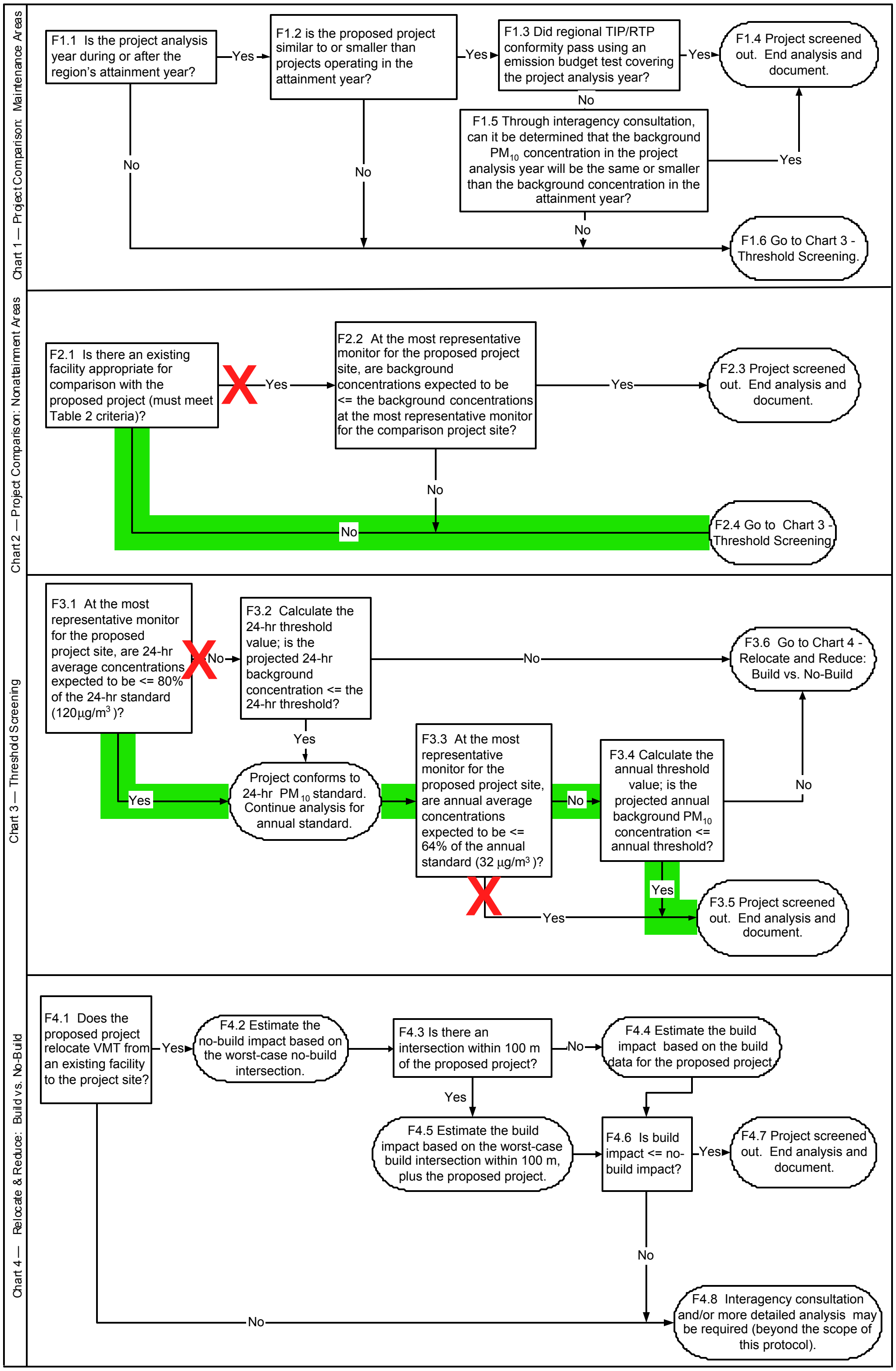


Exhibit 7
Caltrans PM10 Protocol Figure 1

Q: F3.3 At the most representatives monitor for the proposed project site, are annual average concentrations expected to be <= 64 % of the annual standard (32 µg/m3)?

A: No. The annual average PM_{10} concentrations at the Hesperia monitoring station were 44.3 $\mu g/m^3$, 40.5 $\mu g/m^3$, and 38.0 $\mu g/m^3$ for the years 2002, 2003, and 2004 respectively (CARB is not currently reporting complete data for 2005). Therefore, the analysis continues to Box F3.4.

Q: F3.4 Calculate the annual threshold value; is the projected annual background PM_{10} ***concentration <= annual threshold***

A: Yes. The annual background PM_{10} concentration is the measured maximum annual average concentration from the three most recent years of data, or 44.3 $\mu g/m^3$, from the Norco-Norconian site. The annual threshold is calculated as prescribed in the PM_{10} Protocol document and described below.

Table 3 of the PM_{10} Protocol presents estimates of 24-hour PM_{10} project level incremental contribution for various project types. The project type most similar to the proposed project is the freeway with a volume greater than 150,000 vehicles per day. It is estimated that this project type will result in a maximum incremental PM_{10} concentration of 8.0 $\mu g/m^3$ for a 24-hour averaging period. To estimate the annual average incremental contribution a conversion ratio (CR) is used. The CR is the highest ratio of maximum 24-hour concentration to the annual average PM_{10} concentration from the past three years. Based on the data from the Norco-Norconian site the CR is 0.57 based on 2002 data. Therefore, the maximum incremental contribution due to the project is 4.6 $\mu g/m^3$ (maximum 24-hour contribution of 8.0 $\mu g/m^3$ times the CR of 0.57). Subtracting this value from the 50 $\mu g/m^3$ annual average NAAQS gives the annual threshold of 45.4 $\mu g/m^3$.

The maximum annual average background concentration from the most recent three years of monitoring data at the Norco-Norconian site is 44.3 $\mu g/m^3$. This is less than the annual threshold of 45.4 $\mu g/m^3$ calculated above. The analysis then proceeds to box F3.5 where it is concluded that the project is screened out. That is, the analysis concludes that the project will not result in a local PM_{10} impact.

6.4 Local Analysis: $PM_{2.5}$ Operational Impacts

At this time, EPA has not released guidance for performing a quantitative analysis of local $PM_{2.5}$ impacts. Because of this, per 40 CFR 93.123(b)(2) and (4), a qualitative assessment is required to demonstrate that the project will not cause or contribute to any new localized $PM_{2.5}$ violations, increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

6.4.1 Types of Emissions Considered

In accordance with "Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas" (Guidance) developed by the EPA in conjunction with the FHWA in March 2006, this hot-spot analysis will be based only on directly emitted $PM_{2.5}$ emissions. Tailpipe, brake wear, and tire wear $PM_{2.5}$ emissions will be considered in this hot-spot analysis.

Vehicles cause dust from paved and unpaved roads to be re-entrained, or re-suspended, in the atmosphere. According to the March 10, 2006 final rule, road dust emissions are only to be considered in $PM_{2.5}$ hot-spot analyses if the EPA or the state air agency has made a finding that such emissions are a significant contributor to the $PM_{2.5}$ air quality problem (40 CFR 93.102(b)(3)). The EPA or the California Air Resources Board (CARB) has not yet made such finding of significance; and therefore, the re-entrained $PM_{2.5}$ is not considered in this analysis.

Secondary particles formed through $PM_{2.5}$ precursor emissions from a transportation project take several hours to form in the atmosphere giving emissions time to disperse beyond the immediate project area of concern for localized analyses; therefore, they will not be considered in this hot-spot analysis. Secondary emissions of $PM_{2.5}$ are considered as part of the regional emission analysis prepared for the conforming RTP and FTIP.

According to the project schedules, the construction will not last more than 5 years, and construction-related emissions may be considered temporary; therefore, any construction-related $PM_{2.5}$ emissions due to this project will not be included in this hot-spot analysis. This project will comply with the South Coast Air Quality Management District (SCAQMD) Fugitive Dust Rules as discussed in Section 5.5. Excavation, transportation, placement, and handling of excavated soils will result in no visible dust migration. A water truck or tank will be available within the project limits at all times to suppress and control the migration of fugitive dusts from earthwork operations.

6.4.2 Monitored $PM_{2.5}$ Levels

The SCAQMD has divided the SCAB into 38 Source Receptor Areas (SRA) with a designated ambient air monitoring station representative of each area. The project site is located near the convergence of five SRA, 16-North Orange County, 17-Central Orange County, 19-Central Orange County Coastal, 22-Norco/Corona, and 33-Southwest San Bernardino Valley. Of these SRA, only two have monitoring stations that monitor $PM_{2.5}$ levels, the Anaheim-Pampass Lane station in SRA 17 and the Ontario Station in SRA 33. The next nearest station that monitors $PM_{2.5}$ levels is the Riverside-Magnolia Station in SRA 23.

The Ontario Station is located approximately 11 miles north of the site and a little over ½ mile north of SR-60 just east of Grand Avenue. The Anaheim Station is located approximately 13 miles west of the site and ¼ mile south of I-5 near the Euclid Street crossing. The Riverside-Magnolia Station is located approximately 14 miles east-northeast of the site and approximately ½ mile northeast of SR-91 at the intersection of Magnolia Ave. and Arlington Ave.

Table 17, Table 18, and Table 19 present the monitored 24-hour average $PM_{2.5}$ concentrations at the Ontario, Anaheim, and Riverside-Magnolia monitoring stations. The four highest 24-hour concentrations are presented. Concentrations exceeding the 65 $\mu g/m^3$ standard are shown in bold. However, the national $PM_{2.5}$ standard is in terms of the average of the 98^{th} percentile level from the preceding three years. These values are presented at the bottom of the tables. The tables show that the 24-hour $PM_{2.5}$ standard is not exceeded at these three stations.

Table 17
Ontario Four Highest 24-Hour Average $PM_{2.5}$ Measurements ($\mu g/m^3$)

	2002		2003		2004		2005	
	Date	**Level**	**Date**	**Date**	**Level**	**Level**	**Date**	**Level**
First High:	Jan 2	64.8	Oct 27	**88.9**	Mar 19	**86.1**	Oct 22	**87.7**
Second High:	Oct 14	58.0	Oct 9	**68.9**	Jul 5	**77.5**	Nov 6	58.3
Third High:	Feb 17	57.4	Oct 6	**66.9**	Mar 22	59.9	Jan 22	49.5
Fourth High:	Mar 30	53.6	Dec 5	64.1	Jan 19	55.5	Mar 11	42.3
98th Percentile								
1-Year		57.4		**66.9**		--		49.5
3-Year Avg.		62		63		--		--

-- Data Not Reported
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 7/16/06

Table 18
Anaheim Four Highest 24-Hour Average $PM_{2.5}$ Measurements ($\mu g/m^3$)

	2002		2003		2004		2005	
	Date	**Level**	**Date**	**Date**	**Level**	**Level**	**Date**	**Level**
First High:	Jan 2	**68.6**	Oct 26	**115.5**	Oct 7	58.9	Jan 22	54.7
Second High:	Nov 6	64.7	Oct 27	**70.0**	Mar 20	52.9	Oct 21	49.1
Third High:	Dec 4	55.2	Jan 23	**69.5**	Mar 19	51.9	Jul 4	44.3
Fourth High:	Dec 8	52.9	Oct 29	54.4	Mar 22	49.7	Dec 13	43.9
98th Percentile								
1-Year		48.1		51.8		48.2		41.8
3-Year Avg.		--		--		49		47

-- Data Not Reported
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 7/16/06

Table 19
Riverside-Magnolia Four Highest 24-Hour Average $PM_{2.5}$ Measurements ($\mu g/m^3$)

	2002		2003		2004		2005	
	Date	**Level**	**Date**	**Date**	**Level**	**Level**	**Date**	**Level**
First High:	Apr 2	**75.5**	Oct 9	**73.3**	Mar 19	**93.8**	Oct 22	**94.9**
Second High:	Mar 30	**69.6**	Mar 13	59.5	Mar 22	**67.1**	Nov 6	49.1
Third High:	Oct 14	63.7	Sep 30	56.2	Apr 9	53.7	Nov 12	41.0
Fourth High:	Jan 2	61.8	Oct 27	55.5	Jul 5	51.0	Mar 11	39.4
98th Percentile								
1-Year		63.7		56.2		53.7		--
3-Year Avg.		65		62		58		--

-- Data Not Reported
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 7/16/06

Table 20, Table 21, and Table 22 present the annual average monitored $PM_{2.5}$ levels at the Ontario, Anaheim, and Riverside-Magnolia monitoring stations. The federal ambient air quality standard is based on the average of the three previous years. The tables show that the Ontario station's average from the three past years is 21 μg/m^3, The average at the Anaheim station's average is 16 μg/m^3, and Riverside-Magnolia station's average is 20 μg/m^3. Levels at all three stations exceed the 15 μg/m^3 standard. However, the monitoring data shows a definite downward trend in the annual average $PM_{2.5}$ concentrations at all three stations.

Table 20
Ontario Annual Average $PM_{2.5}$ Measurements (μg/m^3)

	2002	2003	2004	2005
National Annual Average:	25.4	23.8	20.9	18.8
National 3-Year Average:	25	25	23	21

-- Data Not Reported
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 7/16/06

Table 21
Anaheim Annual Average $PM_{2.5}$ Measurements (μg/m^3)

	2002	2003	2004	2005
National Annual Average:	18.6	17.3	16.8	14.7
National 3-Year Average:	--	--	17	16

-- Data Not Reported
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 7/16/06

Table 22
Riverside-Magnolia Annual Average $PM_{2.5}$ Measurements (μg/m^3)

	2002	2003	2004	2005
National Annual Average:	27.1	22.6	20.8	18.0
National 3-Year Average:	26	25	23	20

-- Data Not Reported
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 7/16/06

Based on the surrounding conditions one would expect the $PM_{2.5}$ concentrations in the vicinity of the project to be about the average of the three stations. Therefore, the area around the project site likely complies with the 24-hour standard while there may be a few periods exceeding 65 μg/m^3 each year. The annual average $PM_{2.5}$ concentrations in the project area most likely exceed the 15 μg/m^3 standard. However, the monitoring data shows a distinct downward trend in annual $PM_{2.5}$ concentrations at all three sites.

Based on a linear regression of the data presented above, the three-year average 24-hour average concentration in 2010, the opening year of the project, is estimated to be 39.7 μg/m^3 at the Ontario Station, 35.1 μg/m^3 at the Anaheim station, and 31.4 μg/m^3 at the Riverside-Magnolia Station. 24-hour concentrations are projected to be well below the 24-hour standard of 65 μg/m^3. The three-year average of the annual average concentration in 2010 is estimated to be 11.1 μg/m^3 at the Ontario Station, 10.1 μg/m^3 at the Anaheim Station, and 7.3 μg/m^3 at the Riverside-Magnolia Station. The annual average concentration at the Ontario Station is projected to be just below the 12 μg/m^3 standard and the Riverside-Magnolia annual average concentration is projected to be well below the standard.

When projected to 2030, the 24-hour and annual average $PM_{2.5}$ concentrations experienced at all three stations are significantly lower than the current levels. Based on the historical 24-hour and annual average $PM_{2.5}$ concentrations and their projections, constant decrease is anticipated in the future. This trend is consistent with the CARB's plan to achieve attainment for $PM_{2.5}$ by 2010. The Initial Attainment State Implementation Plan (SIP) submittal to the EPA is anticipated by April 5, 2008.

Of interest, is a study published in the Journal of Air and Waste Management Association by Seongheon Kim, Si Shen, and Constantinos Sioutas of the Civil and Environmental Engineering Department at UCLA along with Yifang Zhu and William C. Hinds of the School of Public Health at UCLA sponsored by the Southern California Particle Center. This study measured and analyzed ultra fine particulates at a location in Downey, California, and at a second location in Riverside, California. The Downey Site was located near central Los Angeles along the "Alameda Corridor" which joins the coastal area of Long Beach with downtown Los Angeles, and the I-710 and I-605 freeways. The Riverside Site was located in the Facilities of the Citrus Research Center and Agricultural Experiment Station at the University of California, Riverside, approximately 20 miles east-northeast of the project site. The study concluded that the Downy site would be characterized as a "source" site that is primarily affected by vehicular emission freeways and that the Riverside site would be characterized as a "receptor" site where photochemical secondary reactions form a substantial fraction of particles, along with local vehicular emissions. The project site is located about half way between the Downy and Riverside sites. Therefore, one would expect that the $PM_{2.5}$ concentrations near the project site to be influenced by emissions from upwind sources in the more developed areas of Los Angeles and Long Beach.

6.4.3 Traffic Volumes

Table 23 presents existing average daily traffic volumes, truck percentages and average daily truck volume for SR-91, SR-241, and SR-71 in the project area from Caltrans data. This data shows that the truck volume of SR-91 exceeds 10,000 daily trucks. Volumes on SR-241 and SR-71 do not exceed this number and would not be expected to in the future. Facilities with less than 10,000 trucks per day are not considered to have a significant number of diesel vehicles and are not considered to be of air quality concern. Therefore, the analysis will focus on SR-91.

Table 23
2004 Total Annual Average Daily Traffic Volumes and Truck Percentages (Both Directions)

Highway Segment	Total AADT	% of Trucks 3-4 Axle	5 Axle	Total	Truck AADT
SR-91					
East of Imperial Highway (SR-90)	284,000	2.0%	2.7%	4.7%	13,206
West of SR-71	254,000	2.5%	3.5%	6.0%	15,164
SR-241					
South of SR-91	45,000	1.0%	0.6%	1.7%	765
SR-71					
North of SR-91	49,000	3.8%	3.4%	7.2%	3,528

Source: 2004 Annual Average Daily Truck Traffic on the California State Highway System Compiled by Traffic and Vehicle Data Systems State of California Business, Transportation and Housing Agency Department of Transportation AUGUST 2005 (http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/)

Table 24 presents the existing average daily traffic volumes for eastbound SR-91 taken from the traffic study prepared for the project. The average daily truck traffic volume is also presented. This is based on the estimate of 6.0% of the total AADT being trucks from the Caltrans data presented above. The AM and PM peak hour level of service for existing conditions are also presented.

Table 24
2005 Traffic Volumes on Eastbound SR-91

Segment	Eastbound AADT	Eastbound Truck AADT	LOS (AM/PM)
NB 241 Connector to Coal Canyon	155,000	9,300	D/D
Coal Canyon to Green River Dr.	155,000	9,300	E/E
Green River Dr. to SR-71	146,085	8,765	D/F

Notes:
AADT and LOS are from the traffic study prepared for the project. ("Eastbound SR-91 Lane Addition from SR-241 to SR-71 Final Traffic Analysis Report for the Project Report (PR) and Environmental Document (ED)" Meyer, Mohaddes Associates, February 2006)
Truck AADT based on existing data from Caltrans Traffic and Vehicle Data Systems showing for existing conditions 6% of AADT is trucks on SR-91 west of SR-71. No adjustments were made to account for diesel fueled trucks vs. gas fueled trucks.

Table 25 and Table 26 present traffic volume information for eastbound SR-91 with and without the project for the years 2010 and 2030, respectively. Table 25 shows that the project is not projected to result in a change in traffic volumes in 2010. Further, the table shows that the LOS for the Green River Drive to SR-91 segment is projected to improve from E to D with the project. This improvement in LOS will result in a reduction in congestion, lessen stop-and-go traffic conditions, and increase speeds during congested periods. At speeds below 50 miles per hour, $PM_{2.5}$ emissions decrease with increased speeds. Further, lessening stop-and-go traffic conditions also result in a decrease in emissions by reduction acceleration events which emit much more pollutants than constant speed conditions. While the LOS is not projected to be improved along the other two segments, the project will increase capacity along these segments and therefore reduce congestion, lessen stop-and-go traffic conditions, result in somewhat higher speeds, and decrease delay. Therefore, the project would be expected to result in a reduction in $PM_{2.5}$ emissions from traffic traveling through the project area in 2010.

Table 25
2010 Projected Traffic Volumes on Eastbound SR-91

	No Project			With Project		
Segment	AADT	Truck AADT	LOS (AM/PM)	ADT	Truck ADT	LOS (AM/PM)
NB 241 Connector to Coal Canyon	176,630	10,598	D/D	176,630	10,598	D/D
Coal Canyon to Green River Dr.	171,827	10,310	E/E	171,827	10,310	E/E
Green River Dr. to SR-71	197,774	11,866	E/E	197,774	11,866	D/D

Notes:
AADT was estimated based on the AM and PM Peak hour traffic volumes from the traffic study prepared for the project ("Eastbound SR-91 Lane Addition from SR-241 to SR-71 Final Traffic Analysis Report for the Project Report (PR) and Environmental Document (ED)" Meyer, Mohaddes Associates, February 2006). The traffic study prepared fo the project did not project AADT's for opening year. The ratio between the average of the AM and PM peak hour volumes and the AADT for the year 2030 were used to estimate the 2010 AADT shown in the table.
LOS is from the traffic study prepared for the project ("Eastbound SR-91 Lane Addition from SR-241 to SR-71 Final Traffic Analysis Report for the Project Report (PR) and Environmental Document (ED)" Meyer, Mohaddes Associates, February 2006).
Truck AADT based on existing data from Caltrans Traffic and Vehicle Data Systems showing for existing conditions 6% of AADT is trucks on SR-91 west of SR-71. No adjustments were made to account for diesel fueled trucks vs. gas fueled trucks. Further, no data was available to estimate future truck percentage so the existing percentage was used.

Table 26 shows that the project is projected to result in a slight increase in traffic volumes in 2030. The traffic volumes are projected to increase by 3.3% between NB SR-241 and Green River Drive and 3.5% between Green River Drive and SR-91. The table shows that the LOS for the Green River Drive to SR-91 segment is projected to improve from F to D with the project during the AM peak hour. The PM peak hour LOS is not projected to improve. However, the traffic study indicates that this is due to excess demand from the HOV lanes flowing into the general purpose lanes. The project will increase the number of lanes on the eastbound SR-91 between Coal Canyon and SR-71 by 16.7% which is much greater than the projected increase in traffic volumes due to the project. Therefore, the project would be expected to decrease congestion, lessen stop-and-go traffic conditions, and result in increased speeds through the project area. As discussed above, all of these factors result in a reduction of $PM_{2.5}$ emissions in the project area compared to the no build conditions. Because the additional capacity is greater than the projected increase in traffic volumes, the emission increases due to the additional vehicles would be expected to be largely, if not completely, offset by the decrease in emissions due to the increased capacity. Therefore, the project would be expected to result in a reduction in $PM_{2.5}$ emissions from traffic traveling through the project area in 2030.

Table 26
2030 Projected Traffic Volumes on Eastbound SR-91

	No Project			With Project		
Segment	AADT	Truck AADT	LOS (AM/PM)	ADT	Truck ADT	LOS (AM/PM)
NB 241 Connector to Coal Canyon	222,030	13,322	F/F	229,340	13,760	F/F
Coal Canyon to Green River Dr.	222,030	13,322	F/F	229,340	13,760	F/F
Green River Dr. to SR-71	210,050	12,603	F/F	217,350	13,041	D/F

Notes:
AADT and LOS are from the traffic study prepared for the project. ("Eastbound SR-91 Lane Addition from SR-241 to SR-71 Final Traffic Analysis Report for the Project Report (PR) and Environmental Document (ED)" Meyer, Mohaddes Associates, February 2006)
Truck AADT based on existing data from Caltrans Traffic and Vehicle Data Systems showing for existing conditions 6% of AADT is trucks on SR-91 west of SR-71. No adjustments were made to account for diesel fueled trucks vs. gas fueled trucks. Further, no data was available to estimate future truck percentage so the existing percentage was used.

6.4.4 Conclusion

Transportation conformity is required under CAA section 176(c) to ensure that federally supported highway and transit project activities are consistent with the purpose of the state air quality implementation plan (SIP). Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. As required by the March 10, 2006 final rule, this qualitative $PM_{2.5}$ hot-spot analysis demonstrates that this project meets the CAA conformity requirements to support state and local air quality goals with respect to potential localized air quality impacts.

Historical meteorological and climatic data support that the regional and local meteorological and climatic conditions have been relatively consistent within the last 30 years and likely consistency is anticipated until the horizon year of 2030. In addition, no significant changes to the current general terrain and geographic locations of the project in relation to the coastal SCAB areas, are anticipated.

Monitoring of $PM_{2.5}$ emissions have only recently initiated and do not have a long trail of monitored data available; however, based on the recent data at two closest $PM_{2.5}$ emissions monitoring stations, there is a declining trend of background $PM_{2.5}$ concentrations in the vicinity of the project area.

The monitoring data indicate that the NAAQS for the 24-hour standard has not been exceeded during the last three years of available data, and the 24-hour $PM_{2.5}$ concentrations are likely to continue to meet the NAAQS. Although the monitored annual average $PM_{2.5}$ concentrations exceeded the NAAQS for the last three years of available monitoring, there is a constant trend of declining annual average concentrations similar to the trend in 24-hour data. Based on the current trend, the annual average $PM_{2.5}$ concentrations are likely to be monitored at significantly lower level than the NAAQS by years 2010 or 2030.

The traffic study indicates that traffic volumes are not projected to increase with the project in 2010. In 2030 traffic volumes are projected to increase between 3.3% and 3.5% on eastbound SR-91 with the project. However, this increase in traffic volumes is offset by the increase in capacity provided by the project. Therefore, the project would be expected to decrease congestion, lessen stop-and-go traffic conditions, and result in increased speeds through the project area. All of these factors result in a reduction of $PM_{2.5}$ emissions in the project area compared to the no build conditions. Because the additional capacity is greater than the projected increase in traffic volumes, the emission increases due to the additional vehicles would be expected to be largely, if not completely, offset by the decrease in emissions due to the increased capacity. Therefore, the project would be expected to result in a reduction in $PM_{2.5}$ emissions from traffic traveling through the project area in 2030.

Federal regulations and the State's Diesel Risk Reduction Plan will require future diesel vehicles to have substantially cleaner engines and to use fuels with lower sulfur contents. Thus, even though the project will have an increase in diesel truck traffic in all future analysis years, the increase will be more than offset by the larger decrease in per-vehicle $PM_{2.5}$ emissions. Therefore, the project will not cause higher $PM_{2.5}$ emissions or a $PM_{2.5}$ hot-spot.

The historical meteorological and climatic data, monitored $PM_{2.5}$ emissions data and their declining trend, current and projected traffic data, and the Federal regulations and the State's Plan, support the assertion that the project will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. Activities of this project should, therefore, be considered that they are consistent with the purpose of the SIP and it should be determined that this project conforms to the requirements of the CAA.

7.0 Additional Air Quality Topics

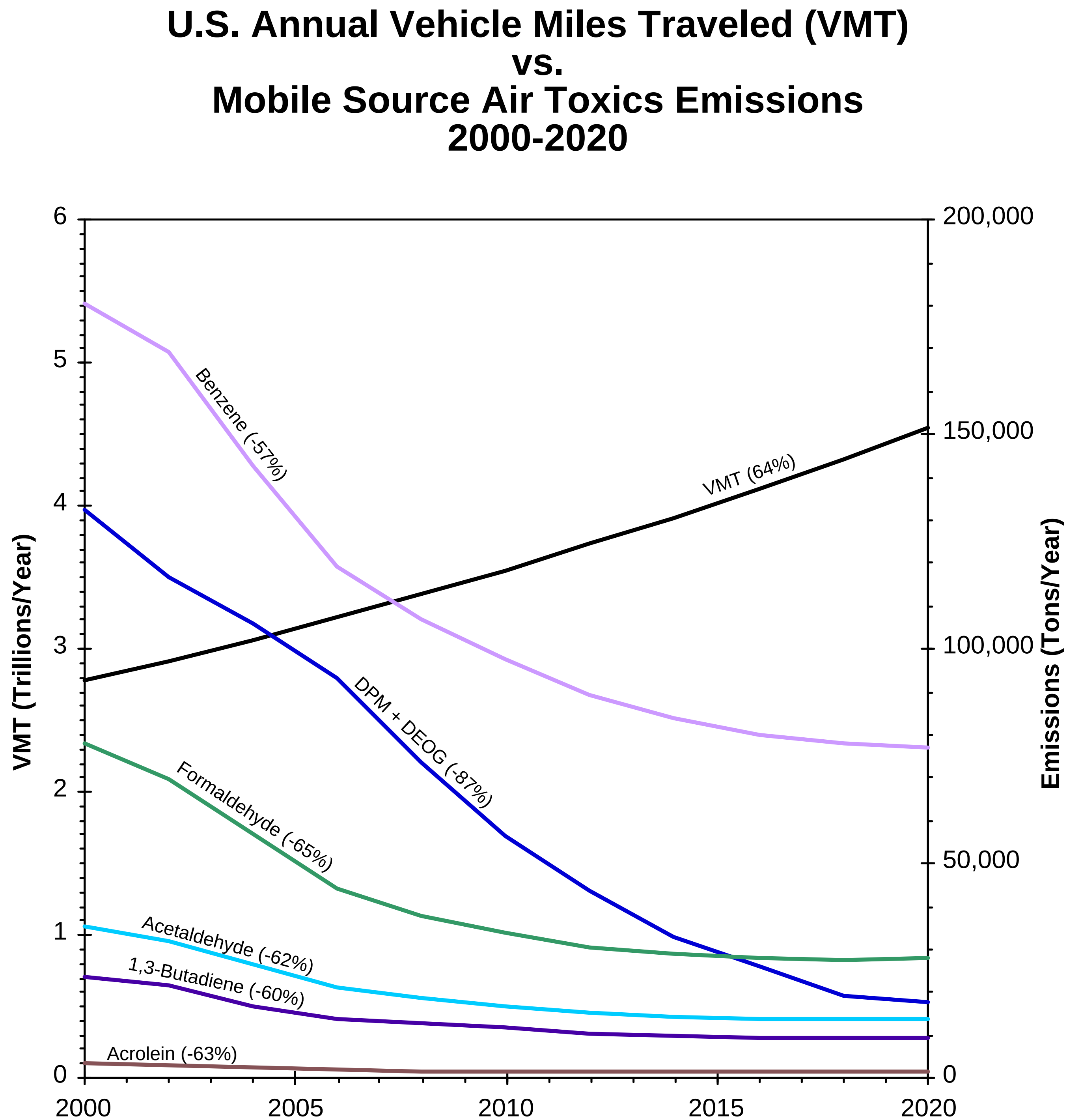
7.1 Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in Exhibit 8.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: Highway Statistics 2000, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. “DPM + DEOG” is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

Exhibit 8
VMT vs. MSAT Emissions

7.1.1 Unavailable Information for Project Specific MSAT Impact Analysis

This study includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the project. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete. Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- **Emissions:** The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

  These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

- **Dispersion.** The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

- **Exposure Levels and Health Effects.** Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.

- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.

- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.

- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

- **Diesel exhaust** also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community. Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

Below, a quantitative analysis of MSAT emissions in the project area is provided. This analysis acknowledges that the project may result in slightly increased exposure to MSAT emissions in certain locations compared to no project conditions. However, the analysis shows that exposure to MSAT emissions in the future will be less than current conditions. The concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

7.1.2 MSAT Emissions in the Project Area

As discussed above there are several uncertainties that do not allow quantitative estimates of health effects from MSAT emissions in the project area. However, one can examine at MSAT emissions in the project area and estimate the relative impacts of MSAT emissions under different scenarios. In California, vehicle emissions are estimated using the EMFAC2002 program published by CARB. However, EMFAC2002 does not calculate MSAT emissions. EMFAC2002 does calculate VOC (Volatile Organic Compound) emissions and except for Diesel Particulate Matter (DPM), MSAT emissions are proportional to VOC emissions. Therefore, the relative changes in VOC emissions in the project area are the same as the relative changes in MSAT emissions (except DPM). For DPM, the primary source is Heavy Duty Trucks and the exhaust PM_{10} emissions for Heavy Duty Trucks is used to calculate DPM Emission. The derivation of emission factors used for this analysis is presented in the appendix along with the EMFAC2002 output files.

The emission factors from EMFAC2002 are pollutant emissions in grams per mile of vehicle travel. Multiplying these emission factors by the number of vehicle miles traveled in the project area provides an estimate of the total emissions from vehicles traveling through the project area. Table 27 presents the average daily traffic volumes for existing conditions as well as future conditions in 2010 and 2030 with and without the project. The length of each segment is also presented in the table. The traffic volumes and segment length are multiplied together and summed to estimate the vehicle miles traveled through the project area for each of the five scenarios. This value is presented in the last row of Table 27.

Table 27
AADT Vehicle Miles Traveled on Eastbound SR-91

		2010		2030		Length
Segment	**Existing**	**No Proj.**	**With Proj.**	**No Proj.**	**With Proj.**	**(mi)**
NB 241 to Coal Cnyn.	155,000	176,630	176,630	222,030	229,340	2.02
Coal Cnyn. to Green River Dr.	155,000	171,827	171,827	222,030	229,340	1.99
Green River Dr. to SR-71	146,085	197,774	197,774	210,050	217,350	1.06
Vehicle Miles Traveled	**776,400**	**908,369**	**908,369**	**1,112,993**	**1,150,044**	

Vehicle emissions vary by speed. Generally, emissions are higher on a grams per mile basis for slower speeds. For some pollutants, including VOC, emissions increase with speed at speeds greater than 50 mph. The traffic engineer for the project was not able to provide average speed estimates for the five scenarios being analyzed. Therefore, emissions for a range of speeds, from 15 mph to 50 mph are presented below as average speeds for all scenarios would not be expected to be outside of these values. Average speeds would actually be expected to be somewhere in the 20 to 35 mph range.

Table 28 presents estimates of VOC emissions from traffic on eastbound SR-91 for speeds in 5 mph increments between 15 mph and 50 mph for the five scenarios being analyzed. The table clearly shows a reduction in VOC emissions if one assumes that speeds remain constant. However, one would expect that speeds would decrease in the future without the project due to increases in projected traffic volumes. Speeds for future conditions with the project would be expected to increase compared to no project conditions.

If one assumes that existing average speeds are in the 30 to 35 mph range, speeds in 2010 would have to be approximately 10 mph slower to result in an increase in VOC emissions. However, the traffic data shows that the project would not be expected to affect traffic volumes in 2010. The project would be expected to increase speeds and reduce stop-and-go traffic in the project area which would result in a decrease in VOC emissions compared to the 2010 no project conditions. Therefore, in 2010, while VOC emissions could increase slightly the project would result in lower emissions compared to the no project conditions.

Table 28 shows that VOC emissions in 2030 are projected to be lower than existing conditions for any speed. The table shows an increase in emissions in 2030 with the project compared to no project conditions with the same speed assumption. This is due to the projected 3.3% to 3.5% increase in traffic volumes. However, the project would provide a greater increase in capacity than the increase in traffic volumes. Therefore, the project would be expected to increase speeds and reduce stop-and-go traffic compared to no project conditions. The data indicates that if the project increases speeds by more than approximately 4 mph the VOC emissions would be the same in 2030 with or without the project.

Table 28
VOC Emissions (lbs/day) on Eastbound SR-91

Speed		2010		2030	
(mph)	Existing	No Proj.	With Proj.	No Proj.	With Proj.
15	713.1	498.8	498.8	132.1	136.5
20	530.1	370.8	370.8	99.8	103.1
25	412.8	289.5	289.5	79.5	82.1
30	337.4	237.2	237.2	66.3	68.5
35	289.2	204.5	204.5	58.6	60.5
40	259.6	184.3	184.3	53.8	55.6
45	244.4	174.0	174.0	51.1	52.8
50	241.9	172.8	172.8	51.9	53.6

Table 29 presents estimates of DPM emissions from traffic on eastbound SR-91 for speeds in 5 mph increments between 15 mph and 50 mph for the five scenarios being analyzed. The table clearly shows a reduction in DPM emissions if one assumes that speeds remain constant. However, one would expect that speeds would decrease in the future without the project due to increases in projected traffic volumes. Speeds for future conditions with the project would be expected to increase compared to no project conditions.

If one assumes that existing average speeds are in the 30 to 35 mph range, speeds in 2010 would have to be approximately 5 mph slower to result in an increase in DPM emissions over existing conditions. However, the traffic data shows that the project would not be expected to affect traffic volumes in 2010. The project would be expected to increase speeds and reduce stop-and-go traffic in the project area, which would result in a decrease in DPM emissions compared to the 2010 no project conditions. Therefore, in 2010, while DPM emissions could increase slightly the project would result in lower emissions compared to the no project conditions.

Table 28 shows that DPM emissions in 2030 are projected to be lower than existing conditions for any speed. The table shows an increase in emissions in 2030 with the project compared to no project conditions with the same speed assumption. This is due to the projected 3.3% to 3.5% increase in traffic volumes. However, the project would provide a greater increase in capacity than the increase in traffic volumes. Therefore, the project would be expected to increase speeds and reduce stop-and-go traffic compared to no project conditions. The data indicates that if the project increases speeds by more than approximately 4 mph the DPM emissions would be the same in 2030 with or without the project.

Table 29
DPM Emissions (lbs/day) on Eastbound SR-91

Speed (mph)	Existing	2010 No Proj.	2010 With Proj.	2030 No Proj.	2030 With Proj.
15	46.2	37.6	37.6	18.3	18.9
20	37.8	30.8	30.8	14.9	15.4
25	31.7	25.8	25.8	12.5	12.9
30	27.1	22.1	22.1	10.7	11.1
35	23.8	19.3	19.3	9.3	9.7
40	21.3	17.3	17.3	8.3	8.6
45	19.5	15.9	15.9	7.7	7.9
50	18.2	14.9	14.9	7.1	7.4

The California Air Resources Board (CARB) has found that diesel particulate matter (PM) poses the greatest cancer risks among all identified air toxics. Diesel trucks contribute more that half of the total diesel combustion sources. However, the CARB has adopted a Diesel Risk Reduction Plan (DRRP) with control measures that would reduce the overall diesel PM emissions by about 85% from 2000 to 2020. These reduction measures are not reflected in the EMFAC2002 emission factors used in the analysis above. Therefore, future DPM emissions would be expected to be reduced even more than indicated above.

In addition, total toxic risk from diesel exhaust may only be exposed for a much shorter duration. Further, diesel PM is only one of many environmental toxics and those of other toxics and other pollutants in various environmental media may over shadow its cancer risks. Thus, while diesel exhaust may pose potential cancer risks, most receptors' short-term exposure would only cause minimal harm, and these risks would also greatly diminish in the future operating years of the project due to planned emission control regulations.

7.2 Naturally Occurring Asbestos (NOA)

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by state, federal, and international agencies and was identified as a toxic air contaminant by the California Air Resources Board (CARB) in 1986. All types of asbestos are hazardous and may cause lung disease and cancer.

Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed.

Serpentinite may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, a rock closely related to serpentinite, may also contain asbestos minerals. Asbestos can also be associated with other rock types in California, though much less frequently than serpentinite and/or ultramafic rock. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in the counties of the Sierra Nevada foothills, the Klamath Mountains, and Coast Ranges. The Governor’s Office of Planning and Research has developed a list of counties with Serpentine and/or Ultramific Rock. Neither Riverside nor Orange County are on this list. Further, the California Department of Conservation, Division of Mines and Geology has developed a map of the state showing the general location of Ultramific rock in the state. This map indicates that there are no occurrences of Ultramific rock in the vicinity of the project nor in either Riverside or Orange Counties.

While unlikely, if naturally occurring asbestos, serpentine, or ultramific rock is discovered during grading operations Section 93105, Title 17 of the California Code of Regulations requires notification of the AQMD by the next business day and implementation of the following measures within 24-hours:

1. Unpaved areas subject to vehicle traffic must be stabilized by being kept adequately wetted, treated with a chemical dust suppressant, or covered with material that contains less than 0.25 percent asbestos;

2. The speed of any vehicles and equipment traveling across unpaved areas must be no more than fifteen (15) miles per hour unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment traveling more than 15 miles per hour from emitting dust that is visible crossing the project boundaries;

3. Storage piles and disturbed areas not subject to vehicular traffic must be stabilized

by being kept adequately wetted, treated with a chemical dust suppressant, or covered with material that contains less than 0.25 percent asbestos; and

4. Activities must be conducted so that no track-out from any road construction project is visible on any paved roadway open to the public.

5. Equipment and operations must not cause the emission of any dust that is visible crossing the project boundaries.

8.0 Conclusion

This project-level Air Quality report addresses all pertinent aspects of conformity and adheres to the Transportation Conformity Rule and currently the proposed project is listed in the FHWA approved 2004 RTP and 2006 RTIP. In any event, an in-depth discussion of project conformity to the FHWA approved 2004 RTP and 2006 RTIP is provided. The essential role of SIP in regional analysis is documented in this report. A comprehensive analysis of project-level CO , PM_{10} and $PM_{2.5}$ has concluded that the proposed project does not pose any significant operational impact on the ambient air quality in the project vicinity. The analysis shows that it is unlikely that the project will cause CO concentrations greater than those modeled in the SCAB CO Attainment Plan and therefore will not result in an exceedance of the CO NAAQS. Based on the most recent 3-years of PM_{10} data at the Norco-Norconian air monitoring station, it is unlikely that the proposed project will cause the ambient PM_{10} to exceed NAAQS. A discussion of fugitive dust control measures is provided, and it is recommended that the measure be included as project commitments prior to construction. The analysis shows that the project would not be expected to cause any new violations, worsen existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS. The analysis shows that in 2010 MSAT emissions in the project area may be somewhat greater than existing conditions but that the project would not result in an increase in MSAT emissions compared to no project conditions. Due to the congestion relief provided by the project, MSAT emissions in 2010 would likely be somewhat lower with the project than without. In 2030, MSAT emissions are projected to be lower than existing conditions either with or without the project. The project could result in a slight increase in MSAT emissions in 2030 compared to conditions without the project due to projected increases in traffic of 3.3%. However, lower emission rates resulting from decreased congestion and increased average speed with the project compared to no project conditions would likely largely offset this increase and could even result in a slight decrease in MSAT emissions in 2030 with the project compared to no project conditions.

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)

Appendix

Project Description from 2006 RTIP

DRAFT 2006 REGIONAL TRANSPORTATION PROGRAM (RTIP) STATE HIGHWAY PROJECTS

ORANGE COUNTY

LEAD AGENCY	PROJECT ID	AIR BASIN	MODEL NO	PROG CODE	RTE	POST BEG	MI END	DESCRIPTION	FUND	YEAR	ENG	ROW	CONS	TOTAL	PRIOR	2006/07	2007/08	2008/09	2009/10-2011/12	PROJECT TOTAL	CONF CAT	ELMT
SAN JUAN CAPISTRANO	ORA000152	SCAB	0305	PLN40	74	.0	.2	ORTEGA HWY (RANCHO VIEJO RD TO JUST EAST OF I-5/SR-74 INTERCHAGE) RDWAY WIDEN ADD RT TRN LNE TO CAPAC & REDUCE QUE ON WB SR-74 TO NB I-5 TRN. N/B FRM 2TO3 & S/B 2TO3 .	CITY ORA-RIP	06/07 06/07	50 2500	0 0	0 0	50 2500	0	2550	0	0	0	2550	NON-EXEMPT	3
CALTRANS	ORA120535	SCAB	0345	CAX63	74	1.0	2.9	SAN JUAN CAPISTRANO - ORTEGA HIGHWAY WIDENING (FROM CALLE ENTRADERO TO ANTONIO PARKWAY; FRM 2 TO 4 LANES DIVIDED)	PVT	07/08	0	11000	0	11000	0	0	11000	0	0	11000	NON-EXEMPT	2
FULLERTON	ORA021201	SCAB	0268	CAR63	90	.0	2.5	IMPERIAL HWY SMART ST (HARBOR TO SR57) RESTRIPE 4 - 6 LNS (HARBOR BLVD & BERRY ST MEDIAN MODIFICATNS AT PUENTE INTERSEC. BUS PADS, BUS TURNOUTS & SOUNDWALLS AT VAR LOCATIONS	ORA-SSP ORA-SSP	PRIOR 06/07	0 0	116 0	0 2425	116 2425	116	2425	0	0	0	2541	NON-EXEMPT	4
LA HABRA	ORA000115	SCAB	2066	CAR63	90	.0	2.5	IMPERIAL HWY SMART ST (LAC TO HARBOR) RESTRIPE 4 TO 6 LNS (LAC LINE TO IDAHO ST. ADD RAISED MEDIAN. MODFY MEDIANS AT 4 INTSECS. ADD BUS PADS, TURNOUTS. (COMBINES ORA028 AND ORA029)	ORA-SSP ORA-SSP	PRIOR 06/07	755 0	3000 0	0 6908	3755 6908	3755	6908	0	0	0	10663	NON-EXEMPT	4
ORANGE COUNTY TRANS AUTHORITY (OCTA)	ORA120336	SCAB	0312	CAR63	91	25.6	34.0	SR-91 EASTBOUND LANE ADDITION BETWEEN SR-241 & SR-71, & IMPROVE NB SR-71 CONNECTOR FROM SR-91 TO STD; ONE LANE AND SHOULDER WIDTH.	STP-IIP	09/10	3000	0	0	3000	0	0	0	0	3000	3000	NON-EXEMPT	1
TCA	ORA052	SCAB	2042	CAN67	241	.0	15.9	(FTC-S) (I-5 TO OSO PKWY) (15MI) 2 MF EA. DIR BY 2010; AND 1 ADDITIONAL M/F EA. DIR. PLS CLMBNG & AUX LANES AS REQ BY 2020 PER SCAG/TCA MOU 4/05/01.	PVT PVT PVT PVT PVT	PRIOR 06/07 07/08 08/09 09/10	5000 20000 10000 0 0	0 35000 0 0 0	0 0 80000 100000 100000	5000 55000 90000 100000 100000	5000	55000	90000	100000	100000	350000	TCM	3
TCA	ORA051	SCAB	2042	CAR62	241	13.8	26.5	(FTC-N) (OSO PKWY TO ETC) (13MI) EXISTING 2 MF IN EA. DIR, 2 ADDITIONAL M/F LANES, PLS CLMBNG & AUX LANS AS REQ BY 2015 PER SCAG/TCA MOU 4/05/01.	PVT PVT	PRIOR 06/07	16000 0	150 0	45200 38400	61350 38400	61350	38400	0	0	0	99750	TCM	2
TCA	ORA050	SCAB	2040	CAR62	241	38.8	12.4	ETC (RTE 241/261/133) (RTE 91 TO I-5/JAMBOREE) EXISTING 2 M/F EA.DIR, 2 ADD'L M/F IN EA. DIR, PLUS CLIMB AND AUX LNS AS REQ, BY 2015 PER SCAG/TCA MOU 4/05/01.	PVT PVT	PRIOR 06/07	26450 2400	690 40	95060 69130	122200 71570	122200	71570	0	0	0	193770	TCM	2
WESTMINSTER	ORA100507	SCCAB	0346	NCRH3	405	.0	.0	CONSTRUCT FOURTH NB THROUGH LANE ON BEACH BLVD AT THE I-405 INTERCHANGE AND REMOVE OFF-RAMP ON I-405 AT BEACH (NORTH-EAST CORNER OF BEACH/EDINGER)	AGENCY DEMOSTL	08/09 08/09	100 400	0 0	0 0	100 400	0	0	0	500	0	500	NON-EXEMPT	1
COSTA MESA	ORA000111	SCAB	0212	CAX70	405	10.8	11.5	NEW OFF-RAMP ON I-405 AT SUSAN STREET @ S. COAST DRIVE (REPLACED W/ORA000186, ORA000110, ORA000182, ORA000191. (FROM 0 TO 1 LANE)	CITY CITY	06/07 09/10	348 0	0 0	0 2054	348 2054	0	348	0	0	2054	2402	NON-EXEMPT	3
COSTA MESA	ORA020103	SCAB	0275	CARH3	405	11.8	11.8	COSTA MESA (FAIRVIEW RD @ I-405 INTERCHANGE) ADD 3RD S/B LEFT-TURN LANE AND 3RD S/B I-405 ONRAMP LANE.	CITY ORA-RIP CITY ORA-RIP	PRIOR PRIOR 06/07 06/07	315 315 0 0	0 0 0 0	0 0 2250 2250	315 315 2250 2250	630	4500	0	0	0	5130	NON-EXEMPT	3
ORANGE COUNTY TRANS AUTHORITY (OCTA)	ORA020110	SCAB	0276	CAN76	405	15.2	16.5	I-405 NORTHBOUND AUXILIARY LANE (MAGNOLIA TO BEACH BLVD) ADD ONE AUX. LANE N/B & S/B -- FROM 5 TO 6 LANES IN EACH DIRECTION.	NH-RIP NH-RIP	PRIOR 08/09	2682 0	1669 0	0 13591	4351 13591	4351	0	0	13591	0	17942	NON-EXEMPT	4
WESTMINSTER	ORA045	SCAB	2124	CAR63	405	17.8	.0	BOLSA AVE (CHESTNUT TO GOLDENWEST) WIDEN BOLSA AVE BRIDGE FROM 4 TO 6 LANES	CITY	10/11	100	0	2100	2200	0	0	0	0	2200	2200	NON-EXEMPT	1

E-Mail Demonstrating PM_{10} Analysis Started Before March 10, 2006

Subject: FW: SR-91PR&ED_ Air Quality Review comments_PM10 Analysis-1
Date: Monday, August 21, 2006 2:26 PM
From: Marzieh.Ghandehari@kimley-horn.com
To: <arman_behtash@dot.ca.gov>
Cc: <danielle.stearns@kimley-horn.com>, <matt@mga1.com>, <cneslage@chambersgroupinc.com>, <reza_aurasteh@dot.ca.gov>, <shay_lynn_harrison@dot.ca.gov>
Conversation: SR-91PR&ED_ Air Quality Review comments_PM10 Analysis

Arman,

Based on your second review comments PM10 analysis was completed before March 6, 2006. Please see e-mail below from Kevin Shannon dated May 02, 2006. Please let me know if you require additional proof that the analysis was completed before March 29, 2006.

Thanks,
Marzieh

Marzieh Ghandehari, P.E.
Kimley-Horn and Associates, Inc.
Suite 140,
2100 W. Orangewood Avenue
Orange, CA 92868
Tel: 714-939-1030
Fax: 714-938-9488

From: Ghandehari, Marzieh
Sent: Tuesday, June 27, 2006 4:09 PM
To: 'Arman Behtash'; 'leo_chen@dot.ca.gov'
Cc: 'shay_lynn_harrison@dot.ca.gov'; Reza Aurasteh; Craig Neslage; 'Matt Jones'; Arshad Rashedi; Stearns, Danielle; 'Brian Liu'; 'Tony Louka'; 'Nassim Elias'
Subject: FW: SR-91PR&ED_ Air Quality Review comments_PM10 Analysis

Arman,

Please review attached draft PM10 analysis and provide your comments.

Thanks,
Marzieh

Marzieh Ghandehari, P.E.
Kimley-Horn and Associates, Inc.

Suite 140,
2100 W. Orangewood Avenue
Orange, CA 92868
Tel: 714-939-1030
Fax: 714-938-9488

From: Ghandehari, Marzieh
Sent: Tuesday, May 02, 2006 3:42 PM
To: 'Arman Behtash'
Cc: 'Reza Aurasteh'; 'Ryan_chamberlain@dot.ca.gov'; 'Leo Chen'; 'TGonzalez@chambersgroupinc.com'; Kevin Shannon; 'matt@mga1.com'; 'arashedi@octa.net'; Stearns, Danielle
Subject: FW: SR-91PR&ED_ Air Quality Review comments_PM10 Analysis
Importance: High

Arman,
Per our telephone conversation this morning, based on your second review comments,attached for your review is PM10 analysis.

Thanks,
Marzieh

Marzieh Ghandehari, P.E.
Kimley-Horn and Associates, Inc.
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2100 W. Orangewood Avenue
Orange, CA 92868
Tel: 714-939-1030
Fax: 714-938-9488

From: Kevin Shannon [mailto:kshannon@chambersgroupinc.com]
Sent: Tuesday, May 02, 2006 1:55 PM
To: Ghandehari, Marzieh
Cc: Tirzo Gonzalez (E-mail)
Subject: SR-91 AQ Excerpts

Per Tirzo's direction, attached are scanned black and white excerpts from the March 6, 2006 AQ study. Specifically, they are Sections 5.4, 6.3, 6.4, and 7.0.
Kevin B. Shannon
Senior Environmental Planner/Project Manager

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Emission Factor Generation Methodology for Mobile Source Air Toxic Analysis

Emission factors for the MSAT analysis were generated using EMFAC2002 (version 2.2). The model was run to generate annual average emission factors for Orange and Riverside Counties using the "Do Each Sub Area" option for Riverside County because the project area lies in both counties. The emissions for the SCAB portion of Riverside County were used. An average temperature of 70˚ F and an average relative humidity of 50% were used. The EMFAC-Area fleet average emissions (g/hr) scenario type was selected with a Rate Summary output file. The model was set to report PM_{10} and ROG emissions. Motor vehicle ROG emissions from EMFAC2002 are effectively the same as VOC emissions. The model was run for the years 2005, 2010 and 2030. The relevant results of the modeling are presented in Table 30 through Table 35.

Table 30 and Table 31 present the results of the EMFAC2002 modeling for Orange County. Table 30 presents ROG emission factors and Table 31 presents PM_{10} emission factors. Table 32 and Table 33 present the results of the EMFAC2002 Modeling for Riverside County. Table 32 presents ROG emission factors and Table 33 presents PM_{10} emission factors. The emission factors are presented for six vehicle types; Light Duty Automobiles (LDA), Light Duty Trucks (LDT), Medium Duty Trucks (MDT), Heavy Duty Trucks (HDT), Urban Busses (UBUS), and Motorcycles (MCY). The last column of the tables "ALL" is a composite emission factor, which is calculated from the emission factors for each vehicle type and the fraction of each vehicle type in the County.

The estimated travel fractions for each vehicle type are presented in Table 34 and Table 35 for each vehicle type for Orange and Riverside Counties respectively. There are three vehicle fractions provided. %VMT is the fraction by vehicle miles traveled, %TRIP is the fraction by trips, and %VEH is the fraction by vehicle population. The composite emission factors in the EMFAC2002 output are calculated by multiplying the vehicle miles traveled fraction times by the emission factor for each vehicle type and summing the results. The data in Table 34 and Table 35 shows a much higher percentage of Medium Duty Trucks and Heavy Duty Trucks than in the project area. Caltrans data indicates that traffic on SR-91 through the project area is comprised of 2.5% Medium Duty Trucks and 3.5% Heavy Duty Trucks. Therefore, the ROG composite emission factor was recalculated using these values for the Medium Duty Trucks and Heavy Duty Trucks. The Urban Bus and Motorcycle percentages used to recalculate the composite emission factors were unchanged from the EMFAC2002 estimates. The remaining percentage of vehicles was attributed to Light Duty Automobiles and Light Duty Trucks in the same proportion as the EMFAC2002 estimates. The percentages used to calculate the composite ROG emission factors are presented in Table 36 and Table 37. For PM_{10} we are only concerned with Diesel PM_{10} emissions. Heavy Duty Trucks are the primary source of these emissions. Therefore, the Heavy Duty Trucks PM_{10} emission factors presented in Table 31 and Table 33 were used for the analysis.

Table 38 presents the recalculated composite ROG emission factors for both Orange and Riverside Counties for the three analysis years along with the average of the two counties. The average is used in the analysis presented in Section 7.1. Table 39 presents the Heavy Duty Truck Exhaust PM_{10} Emission factors for both Orange and Riverside Counties for the three analysis years along with the average of the two counties. The average is used in the analysis presented in Section 7.1.

Table 30
Orange County ROG Emission Factors

Speed (mph)	Emissions (grams/mile) LDA	LDT	MDT	HDT	UBUS	MCY	ALL
Year 2005							
5	0.693	0.691	0.909	2.661	7.843	5.137	0.839
10	0.457	0.461	0.606	1.883	5.237	4.027	0.564
15	0.317	0.323	0.424	1.386	3.645	3.305	0.398
20	0.232	0.238	0.311	1.059	2.644	2.841	0.295
25	0.178	0.184	0.238	0.838	1.997	2.559	0.229
30	0.144	0.150	0.192	0.686	1.572	2.416	0.187
35	0.122	0.128	0.162	0.580	1.288	2.391	0.160
40	0.110	0.114	0.143	0.506	1.100	2.482	0.144
45	0.103	0.108	0.133	0.455	0.978	2.700	0.135
50	0.102	0.107	0.130	0.422	0.906	3.078	0.133
55	0.107	0.111	0.133	0.402	0.874	3.675	0.139
60	0.117	0.122	0.143	0.395	0.878	4.593	0.151
65	0.136	0.140	0.161	0.400	0.919	6.008	0.174
Year 2010							
5	0.383	0.449	0.626	1.688	6.966	4.913	0.525
10	0.249	0.297	0.416	1.216	4.654	3.789	0.352
15	0.171	0.206	0.290	0.910	3.240	3.067	0.248
20	0.124	0.150	0.213	0.706	2.351	2.605	0.184
25	0.095	0.115	0.163	0.566	1.778	2.323	0.143
30	0.076	0.093	0.131	0.468	1.400	2.175	0.117
35	0.065	0.080	0.111	0.399	1.148	2.139	0.100
40	0.058	0.071	0.098	0.350	0.981	2.210	0.090
45	0.054	0.067	0.091	0.316	0.872	2.396	0.085
50	0.054	0.066	0.089	0.294	0.808	2.727	0.085
55	0.056	0.069	0.091	0.280	0.780	3.255	0.088
60	0.062	0.075	0.098	0.275	0.784	4.073	0.097
65	0.072	0.087	0.110	0.278	0.821	5.338	0.112
Year 2030							
5	0.057	0.098	0.151	0.464	2.262	4.672	0.116
10	0.036	0.062	0.097	0.357	1.530	3.505	0.078
15	0.024	0.042	0.067	0.282	1.079	2.768	0.056
20	0.017	0.030	0.049	0.229	0.793	2.300	0.042
25	0.013	0.023	0.037	0.190	0.606	2.013	0.034
30	0.010	0.018	0.030	0.162	0.483	1.856	0.028
35	0.009	0.015	0.025	0.141	0.400	1.802	0.024
40	0.008	0.013	0.022	0.126	0.345	1.844	0.022
45	0.007	0.012	0.020	0.115	0.310	1.987	0.022
50	0.007	0.012	0.020	0.107	0.290	2.253	0.022
55	0.007	0.013	0.020	0.103	0.281	2.687	0.023
60	0.008	0.014	0.022	0.100	0.285	3.368	0.026
65	0.009	0.016	0.025	0.101	0.299	4.434	0.031

Source:EMFAC2002 v2.2

Table 31
Orange County Exhaust PM_{10} Emission Factors

Speed (mph)	Emissions (grams/mile) LDA	LDT	MDT	HDT	UBUS	MCY	ALL
Year 2005							
5	0.047	0.069	0.082	0.686	0.655	0.066	0.088
10	0.031	0.046	0.056	0.537	0.472	0.052	0.063
15	0.022	0.032	0.040	0.431	0.353	0.043	0.047
20	0.016	0.024	0.030	0.353	0.273	0.037	0.036
25	0.013	0.018	0.024	0.296	0.219	0.034	0.029
30	0.010	0.015	0.019	0.253	0.183	0.032	0.024
35	0.009	0.013	0.016	0.222	0.157	0.032	0.021
40	0.008	0.011	0.015	0.199	0.140	0.033	0.019
45	0.007	0.011	0.014	0.182	0.130	0.036	0.017
50	0.007	0.010	0.013	0.170	0.124	0.041	0.017
55	0.007	0.011	0.013	0.163	0.124	0.048	0.017
60	0.008	0.012	0.014	0.159	0.127	0.060	0.017
65	0.009	0.013	0.016	0.159	0.135	0.078	0.018
Year 2010							
5	0.051	0.084	0.098	0.503	0.577	0.052	0.088
10	0.033	0.055	0.065	0.394	0.416	0.041	0.061
15	0.023	0.038	0.046	0.315	0.310	0.034	0.045
20	0.017	0.028	0.034	0.258	0.240	0.029	0.034
25	0.013	0.021	0.027	0.216	0.193	0.026	0.027
30	0.010	0.017	0.022	0.185	0.160	0.025	0.023
35	0.009	0.015	0.018	0.162	0.138	0.025	0.019
40	0.008	0.013	0.016	0.145	0.123	0.026	0.017
45	0.007	0.012	0.015	0.133	0.114	0.028	0.016
50	0.007	0.012	0.015	0.125	0.109	0.031	0.016
55	0.008	0.013	0.015	0.119	0.108	0.037	0.016
60	0.008	0.014	0.016	0.117	0.111	0.046	0.016
65	0.009	0.016	0.018	0.117	0.118	0.060	0.018
Year 2030							
5	0.053	0.096	0.113	0.203	0.345	0.030	0.078
10	0.034	0.062	0.073	0.159	0.247	0.024	0.052
15	0.024	0.042	0.050	0.127	0.184	0.019	0.036
20	0.017	0.030	0.037	0.104	0.142	0.017	0.027
25	0.013	0.023	0.028	0.087	0.113	0.015	0.021
30	0.010	0.019	0.022	0.075	0.094	0.014	0.017
35	0.009	0.016	0.019	0.065	0.081	0.014	0.014
40	0.008	0.014	0.017	0.058	0.072	0.014	0.013
45	0.007	0.013	0.016	0.053	0.066	0.016	0.012
50	0.007	0.013	0.015	0.050	0.063	0.018	0.012
55	0.008	0.014	0.016	0.048	0.063	0.021	0.012
60	0.008	0.015	0.017	0.047	0.065	0.026	0.013
65	0.010	0.017	0.020	0.047	0.069	0.034	0.015

Source:EMFAC2002 v2.2

Table 32
Riverside County (SCAB) ROG Emission Factors

Speed (mph)	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
	Emissions (grams/mile)						
Year 2005							
5	0.670	0.857	1.143	3.159	10.074	5.140	0.947
10	0.441	0.577	0.772	2.251	6.674	4.030	0.641
15	0.306	0.408	0.546	1.668	4.607	3.307	0.456
20	0.223	0.303	0.404	1.281	3.315	2.843	0.340
25	0.171	0.236	0.313	1.019	2.484	2.560	0.266
30	0.138	0.193	0.253	0.838	1.940	2.417	0.218
35	0.118	0.166	0.215	0.711	1.578	2.393	0.187
40	0.105	0.149	0.191	0.622	1.338	2.483	0.168
45	0.099	0.141	0.178	0.560	1.182	2.701	0.158
50	0.098	0.141	0.174	0.519	1.089	3.079	0.156
55	0.102	0.147	0.178	0.496	1.045	3.677	0.162
60	0.113	0.162	0.191	0.487	1.045	4.596	0.176
65	0.131	0.187	0.216	0.493	1.090	6.011	0.202
Year 2010							
5	0.342	0.511	0.708	1.857	8.490	4.905	0.562
10	0.222	0.340	0.477	1.345	5.625	3.780	0.380
15	0.151	0.238	0.337	1.010	3.885	3.056	0.270
20	0.109	0.175	0.249	0.786	2.796	2.594	0.202
25	0.083	0.135	0.193	0.632	2.096	2.312	0.158
30	0.067	0.110	0.157	0.524	1.638	2.164	0.130
35	0.057	0.094	0.133	0.447	1.333	2.128	0.112
40	0.051	0.085	0.118	0.393	1.131	2.197	0.101
45	0.048	0.080	0.110	0.356	0.999	2.382	0.095
50	0.047	0.080	0.107	0.330	0.921	2.711	0.094
55	0.049	0.083	0.110	0.316	0.884	3.236	0.098
60	0.054	0.091	0.118	0.310	0.884	4.049	0.107
65	0.063	0.106	0.134	0.312	0.922	5.308	0.124
Year 2030							
5	0.050	0.093	0.147	0.499	2.187	4.678	0.118
10	0.031	0.058	0.094	0.385	1.460	3.510	0.080
15	0.021	0.040	0.066	0.304	1.015	2.771	0.058
20	0.015	0.028	0.048	0.247	0.736	2.303	0.044
25	0.011	0.021	0.037	0.206	0.556	2.015	0.036
30	0.009	0.017	0.030	0.175	0.437	1.857	0.030
35	0.008	0.014	0.025	0.153	0.358	1.804	0.026
40	0.007	0.013	0.022	0.136	0.306	1.846	0.024
45	0.006	0.012	0.021	0.125	0.272	1.988	0.023
50	0.006	0.012	0.020	0.116	0.252	2.255	0.023
55	0.007	0.012	0.020	0.111	0.243	2.689	0.025
60	0.007	0.013	0.022	0.109	0.244	3.371	0.028
65	0.008	0.015	0.024	0.109	0.255	4.438	0.033

Source:EMFAC2002 v2.2

Table 33
Riverside County (SCAB) Exhaust PM_{10} Emission Factors

Speed (mph)	Emissions (grams/mile) LDA	LDT	MDT	HDT	UBUS	MCY	ALL
Year 2005							
5	0.670	0.857	1.143	3.159	10.074	5.140	0.947
10	0.441	0.577	0.772	2.251	6.674	4.030	0.641
15	0.306	0.408	0.546	1.668	4.607	3.307	0.456
20	0.223	0.303	0.404	1.281	3.315	2.843	0.340
25	0.171	0.236	0.313	1.019	2.484	2.560	0.266
30	0.138	0.193	0.253	0.838	1.940	2.417	0.218
35	0.118	0.166	0.215	0.711	1.578	2.393	0.187
40	0.105	0.149	0.191	0.622	1.338	2.483	0.168
45	0.099	0.141	0.178	0.560	1.182	2.701	0.158
50	0.098	0.141	0.174	0.519	1.089	3.079	0.156
55	0.102	0.147	0.178	0.496	1.045	3.677	0.162
60	0.113	0.162	0.191	0.487	1.045	4.596	0.176
65	0.131	0.187	0.216	0.493	1.090	6.011	0.202
Year 2010							
5	0.342	0.511	0.708	1.857	8.490	4.905	0.562
10	0.222	0.340	0.477	1.345	5.625	3.780	0.380
15	0.151	0.238	0.337	1.010	3.885	3.056	0.270
20	0.109	0.175	0.249	0.786	2.796	2.594	0.202
25	0.083	0.135	0.193	0.632	2.096	2.312	0.158
30	0.067	0.110	0.157	0.524	1.638	2.164	0.130
35	0.057	0.094	0.133	0.447	1.333	2.128	0.112
40	0.051	0.085	0.118	0.393	1.131	2.197	0.101
45	0.048	0.080	0.110	0.356	0.999	2.382	0.095
50	0.047	0.080	0.107	0.330	0.921	2.711	0.094
55	0.049	0.083	0.110	0.316	0.884	3.236	0.098
60	0.054	0.091	0.118	0.310	0.884	4.049	0.107
65	0.063	0.106	0.134	0.312	0.922	5.308	0.124
Year 2030							
5	0.050	0.093	0.147	0.499	2.187	4.678	0.118
10	0.031	0.058	0.094	0.385	1.460	3.510	0.080
15	0.021	0.040	0.066	0.304	1.015	2.771	0.058
20	0.015	0.028	0.048	0.247	0.736	2.303	0.044
25	0.011	0.021	0.037	0.206	0.556	2.015	0.036
30	0.009	0.017	0.030	0.175	0.437	1.857	0.030
35	0.008	0.014	0.025	0.153	0.358	1.804	0.026
40	0.007	0.013	0.022	0.136	0.306	1.846	0.024
45	0.006	0.012	0.021	0.125	0.272	1.988	0.023
50	0.006	0.012	0.020	0.116	0.252	2.255	0.023
55	0.007	0.012	0.020	0.111	0.243	2.689	0.025
60	0.007	0.013	0.022	0.109	0.244	3.371	0.028
65	0.008	0.015	0.024	0.109	0.255	4.438	0.033

Source:EMFAC2002 v2.2

Table 34
Orange County EMFAC2002 Estimated Travel Factions

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
Year 2005							
%VMT	57.9%	28.0%	8.8%	4.7%	0.3%	0.3%	100.0%
%TRIP	55.6%	26.4%	11.7%	5.8%	0.0%	0.5%	100.0%
%VEH	59.5%	28.2%	8.1%	2.6%	0.1%	1.5%	100.0%
Year 2010							
%VMT	57.6%	27.9%	8.8%	5.0%	0.3%	0.4%	100.0%
%TRIP	54.7%	26.9%	12.1%	5.8%	0.1%	0.5%	100.0%
%VEH	58.5%	28.7%	8.4%	2.7%	0.1%	1.6%	100.0%
Year 2030							
%VMT	57.8%	28.7%	8.5%	4.4%	0.3%	0.3%	100.0%
%TRIP	55.0%	27.6%	11.8%	5.0%	0.1%	0.4%	100.0%
%VEH	57.8%	29.5%	8.5%	2.8%	0.1%	1.3%	100.0%

Source:EMFAC2002 v2.2

Table 35
Riverside County SCAB EMFAC2002 Estimated Travel Factions

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
Year 2005							
%VMT	51.5%	34.7%	7.7%	5.5%	0.2%	0.4%	100.0%
%TRIP	48.6%	32.8%	11.7%	6.3%	0.0%	0.6%	100.0%
%VEH	51.9%	35.0%	7.1%	3.9%	0.1%	1.9%	100.0%
Year 2010							
%VMT	50.6%	34.7%	7.8%	6.1%	0.2%	0.4%	100.0%
%TRIP	47.7%	33.1%	12.3%	6.2%	0.0%	0.6%	100.0%
%VEH	50.9%	35.5%	7.5%	4.1%	0.1%	2.0%	100.0%
Year 2030							
%VMT	50.8%	35.8%	7.4%	5.4%	0.2%	0.3%	100.0%
%TRIP	48.6%	34.3%	11.5%	5.0%	0.0%	0.5%	100.0%
%VEH	50.6%	36.2%	7.3%	4.1%	0.1%	1.7%	100.0%

Source:EMFAC2002 v2.2

Table 36
Orange County Travel Factions Used to Calculate Composite ROG Emission Factors

Year	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
2005	63.0%	30.4%	2.5%	3.5%	0.3%	0.3%	100.0%
2010	62.9%	30.4%	2.5%	3.5%	0.3%	0.4%	100.0%
2030	62.4%	31.0%	2.5%	3.5%	0.3%	0.3%	100.0%

Table 37
Riverside County (SCAB) Travel Factions Used to Calculate Composite ROG Emission Factors

Year	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
2005	55.8%	37.6%	2.5%	3.5%	0.2%	0.4%	100.0%
2010	55.4%	38.0%	2.5%	3.5%	0.2%	0.4%	100.0%
2030	54.8%	38.7%	2.5%	3.5%	0.2%	0.3%	100.0%

Table 38
Calculated Composite ROG Emission Factors

Speed	Orange County			Riverside County			Average		
(mph)	2005	2010	2030	2005	2010	2030	2005	2010	2030
5	0.801	0.493	0.107	0.945	0.555	0.115	0.873	0.524	0.111
10	0.537	0.329	0.072	0.640	0.376	0.078	0.588	0.352	0.075
15	0.378	0.231	0.051	0.455	0.267	0.057	0.417	0.249	0.054
20	0.280	0.171	0.038	0.340	0.199	0.043	0.310	0.185	0.041
25	0.217	0.133	0.031	0.265	0.156	0.034	0.241	0.145	0.032
30	0.177	0.109	0.025	0.217	0.128	0.029	0.197	0.118	0.027
35	0.151	0.094	0.022	0.187	0.110	0.025	0.169	0.102	0.024
40	0.136	0.085	0.021	0.167	0.100	0.023	0.152	0.092	0.022
45	0.128	0.080	0.020	0.158	0.094	0.022	0.143	0.087	0.021
50	0.127	0.080	0.020	0.156	0.093	0.022	0.141	0.086	0.021
55	0.132	0.084	0.021	0.161	0.096	0.024	0.147	0.090	0.023
60	0.145	0.093	0.024	0.176	0.105	0.026	0.160	0.099	0.025
65	0.167	0.108	0.029	0.202	0.121	0.031	0.185	0.115	0.030

Table 39
Heavy Duty Truck Exhaust PM_{10} Emission Factors

Speed	Orange County			Riverside County			Average		
(mph)	2005	2010	2030	2005	2010	2030	2005	2010	2030
5	0.801	0.493	0.107	0.945	0.555	0.115	0.873	0.524	0.111
10	0.537	0.329	0.072	0.640	0.376	0.078	0.588	0.352	0.075
15	0.378	0.231	0.051	0.455	0.267	0.057	0.417	0.249	0.054
20	0.280	0.171	0.038	0.340	0.199	0.043	0.310	0.185	0.041
25	0.217	0.133	0.031	0.265	0.156	0.034	0.241	0.145	0.032
30	0.177	0.109	0.025	0.217	0.128	0.029	0.197	0.118	0.027
35	0.151	0.094	0.022	0.187	0.110	0.025	0.169	0.102	0.024
40	0.136	0.085	0.021	0.167	0.100	0.023	0.152	0.092	0.022
45	0.128	0.080	0.020	0.158	0.094	0.022	0.143	0.087	0.021
50	0.127	0.080	0.020	0.156	0.093	0.022	0.141	0.086	0.021
55	0.132	0.084	0.021	0.161	0.096	0.024	0.147	0.090	0.023
60	0.145	0.093	0.024	0.176	0.105	0.026	0.160	0.099	0.025
65	0.167	0.108	0.029	0.202	0.121	0.031	0.185	0.115	0.030

Orange County EMFAC2002 Output File

```
Title    : Orange County 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count          County Average

                             Table   1:  Running Exhaust Emissions (grams/mile)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.693	0.691	0.909	2.661	7.843	5.137	0.839
10	0.457	0.461	0.606	1.883	5.237	4.027	0.564
15	0.317	0.323	0.424	1.386	3.645	3.305	0.398
20	0.232	0.238	0.311	1.059	2.644	2.841	0.295
25	0.178	0.184	0.238	0.838	1.997	2.559	0.229
30	0.144	0.150	0.192	0.686	1.572	2.416	0.187
35	0.122	0.128	0.162	0.580	1.288	2.391	0.160
40	0.110	0.114	0.143	0.506	1.100	2.482	0.144
45	0.103	0.108	0.133	0.455	0.978	2.700	0.135
50	0.102	0.107	0.130	0.422	0.906	3.078	0.133
55	0.107	0.111	0.133	0.402	0.874	3.675	0.139
60	0.117	0.122	0.143	0.395	0.878	4.593	0.151
65	0.136	0.140	0.161	0.400	0.919	6.008	0.174

Pollutant Name: Carbon Monoxide   Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	7.447	8.971	9.388	27.242	65.609	38.317	9.244
10	6.353	7.570	7.544	18.288	43.367	31.473	7.550
15	5.537	6.540	6.292	12.943	30.312	27.208	6.376
20	4.910	5.762	5.408	9.654	22.402	24.753	5.533
25	4.420	5.164	4.769	7.590	17.505	23.699	4.911
30	4.034	4.701	4.299	6.289	14.461	23.878	4.447
35	3.729	4.345	3.956	5.491	12.629	25.324	4.103
40	3.495	4.078	3.715	5.054	11.659	28.275	3.859
45	3.323	3.893	3.565	4.903	11.378	33.245	3.703
50	3.215	3.789	3.505	5.014	11.737	41.170	3.639
55	3.175	3.775	3.548	5.408	12.798	53.705	3.681
60	3.221	3.873	3.720	6.151	14.751	73.801	3.859
65	3.383	4.124	4.074	7.382	17.971	106.838	4.234

Pollutant Name: Oxides of Nitrogen   Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.617	0.909	1.633	16.055	23.490	0.953	1.579
10	0.533	0.778	1.396	13.477	18.486	0.992	1.338
15	0.472	0.683	1.229	11.725	15.331	1.033	1.170
20	0.428	0.614	1.112	10.565	13.361	1.075	1.055
25	0.395	0.565	1.033	9.849	12.199	1.119	0.979
30	0.373	0.532	0.984	9.491	11.633	1.164	0.934
35	0.359	0.511	0.960	9.448	11.558	1.210	0.915
40	0.351	0.501	0.959	9.711	11.949	1.256	0.922
45	0.351	0.501	0.981	10.304	12.852	1.304	0.954
50	0.356	0.512	1.027	11.291	14.397	1.352	1.015
55	0.369	0.534	1.103	12.783	16.835	1.400	1.113
60	0.390	0.570	1.217	14.965	20.609	1.450	1.258
65	0.420	0.622	1.382	18.134	26.494	1.499	1.470

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	990.724	1196.169	1712.184	2037.997	2617.396	223.153	1162.535
10	747.598	903.245	1263.094	1881.937	2201.258	190.574	891.766
15	586.098	708.641	975.066	1789.778	1955.514	165.453	713.413
20	477.202	577.415	786.245	1733.664	1805.884	146.020	593.943
25	403.432	488.512	661.138	1698.790	1712.892	131.004	513.418
30	354.082	429.035	578.879	1677.064	1654.958	119.487	459.757
35	322.583	391.070	527.084	1663.990	1620.096	110.812	425.606
40	305.013	369.890	498.560	1657.109	1601.747	104.514	406.606
45	299.269	362.962	489.547	1655.209	1596.681	100.285	400.432
50	304.643	369.434	498.855	1657.967	1604.036	97.943	406.314
55	321.685	389.969	527.604	1665.854	1625.067	97.428	424.879
60	352.306	426.874	579.487	1680.272	1663.513	98.804	458.281
65	400.173	484.569	661.635	1703.976	1726.721	102.286	510.655

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.010	0.012	0.019	0.135	0.127	0.003	0.017
10	0.007	0.009	0.015	0.133	0.122	0.003	0.015
15	0.006	0.007	0.012	0.132	0.120	0.002	0.013
20	0.005	0.006	0.010	0.132	0.118	0.002	0.012
25	0.004	0.005	0.009	0.131	0.117	0.002	0.011
30	0.004	0.004	0.008	0.131	0.117	0.002	0.011
35	0.003	0.004	0.008	0.131	0.116	0.002	0.010
40	0.003	0.004	0.007	0.131	0.116	0.002	0.010
45	0.003	0.004	0.007	0.131	0.116	0.002	0.010
50	0.003	0.004	0.007	0.131	0.116	0.002	0.010
55	0.003	0.004	0.008	0.131	0.116	0.002	0.010
60	0.004	0.004	0.008	0.131	0.117	0.002	0.011
65	0.004	0.005	0.009	0.131	0.117	0.003	0.011

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.047	0.069	0.082	0.686	0.655	0.066	0.088
10	0.031	0.046	0.056	0.537	0.472	0.052	0.063
15	0.022	0.032	0.040	0.431	0.353	0.043	0.047
20	0.016	0.024	0.030	0.353	0.273	0.037	0.036
25	0.013	0.018	0.024	0.296	0.219	0.034	0.029
30	0.010	0.015	0.019	0.253	0.183	0.032	0.024
35	0.009	0.013	0.016	0.222	0.157	0.032	0.021
40	0.008	0.011	0.015	0.199	0.140	0.033	0.019
45	0.007	0.011	0.014	0.182	0.130	0.036	0.017
50	0.007	0.010	0.013	0.170	0.124	0.041	0.017
55	0.007	0.011	0.013	0.163	0.124	0.048	0.017
60	0.008	0.012	0.014	0.159	0.127	0.060	0.017
65	0.009	0.013	0.016	0.159	0.135	0.078	0.018

Pollutant Name: PM10 - Tire Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.008	0.008	0.009	0.025	0.010	0.004	0.009
10	0.008	0.008	0.009	0.025	0.010	0.004	0.009
15	0.008	0.008	0.009	0.025	0.010	0.004	0.009
20	0.008	0.008	0.009	0.025	0.010	0.004	0.009
25	0.008	0.008	0.009	0.025	0.010	0.004	0.009
30	0.008	0.008	0.009	0.025	0.010	0.004	0.009
35	0.008	0.008	0.009	0.025	0.010	0.004	0.009
40	0.008	0.008	0.009	0.025	0.010	0.004	0.009
45	0.008	0.008	0.009	0.025	0.010	0.004	0.009
50	0.008	0.008	0.009	0.025	0.010	0.004	0.009
55	0.008	0.008	0.009	0.025	0.010	0.004	0.009
60	0.008	0.008	0.009	0.025	0.010	0.004	0.009
65	0.008	0.008	0.009	0.025	0.010	0.004	0.009

Pollutant Name: PM10 - Break Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.013	0.013	0.013	0.013	0.013	0.013	0.013
10	0.013	0.013	0.013	0.013	0.013	0.013	0.013
15	0.013	0.013	0.013	0.013	0.013	0.013	0.013
20	0.013	0.013	0.013	0.013	0.013	0.013	0.013
25	0.013	0.013	0.013	0.013	0.013	0.013	0.013
30	0.013	0.013	0.013	0.013	0.013	0.013	0.013
35	0.013	0.013	0.013	0.013	0.013	0.013	0.013
40	0.013	0.013	0.013	0.013	0.013	0.013	0.013
45	0.013	0.013	0.013	0.013	0.013	0.013	0.013
50	0.013	0.013	0.013	0.013	0.013	0.013	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013	0.013
60	0.013	0.013	0.013	0.013	0.013	0.013	0.013
65	0.013	0.013	0.013	0.013	0.013	0.013	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	8.796	7.239	4.948	3.254	3.213	28.033	8.024
10	11.648	9.587	6.668	4.893	4.831	33.338	10.628
15	14.848	12.222	8.642	6.964	6.878	38.620	13.555
20	18.228	15.004	10.772	9.383	9.271	43.598	16.649
25	21.555	17.744	12.908	11.968	11.831	47.950	19.699
30	24.559	20.218	14.864	14.451	14.294	51.320	22.454
35	26.966	22.198	16.442	16.517	16.348	53.349	24.661
40	28.536	23.490	17.469	17.869	17.699	53.708	26.097
45	29.107	23.957	17.825	18.298	18.137	52.156	26.610
50	28.622	23.553	17.468	17.734	17.592	48.608	26.148
55	27.133	22.324	16.445	16.268	16.148	43.211	24.761
60	24.800	20.398	14.877	14.124	14.029	36.398	22.597
65	21.852	17.969	12.939	11.605	11.535	28.862	19.875

Pollutant Name: Diesel - mi/gal   Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	27.543	29.010	22.304	5.384	3.707	0.000	9.909
10	27.543	29.010	22.304	5.384	3.707	0.000	9.909
15	27.543	29.010	22.304	5.384	3.707	0.000	9.909
20	27.543	29.010	22.304	5.384	3.707	0.000	9.909
25	27.543	29.010	22.304	5.384	3.707	0.000	9.909
30	27.543	29.010	22.304	5.384	3.707	0.000	9.909
35	27.543	29.010	22.304	5.384	3.707	0.000	9.909
40	27.543	29.010	22.304	5.384	3.707	0.000	9.909
45	27.543	29.010	22.304	5.384	3.707	0.000	9.909
50	27.543	29.010	22.304	5.384	3.707	0.000	9.909
55	27.543	29.010	22.304	5.384	3.707	0.000	9.909
60	27.543	29.010	22.304	5.384	3.707	0.000	9.909
65	27.543	29.010	22.304	5.384	3.707	0.000	9.909

Title   : Orange County 2005
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area   : Orange County
****
Year:2005 -- Model Years 1965 to 2005 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Apr 23 2003

County Average   Orange Count   County Average

Table   2: Starting Emissions (grams/trip)

Pollutant Name: Reactive Org Gases   Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.126	0.117	0.222	0.689	0.733	1.423	0.173
10	0.210	0.199	0.366	0.960	1.009	1.458	0.275
20	0.367	0.350	0.634	1.469	1.527	1.556	0.463
30	0.509	0.486	0.875	1.934	2.000	1.693	0.634
40	0.635	0.607	1.089	2.354	2.430	1.870	0.786
50	0.745	0.714	1.276	2.730	2.815	2.085	0.920
60	0.835	0.803	1.430	3.020	3.112	2.198	1.030
120	1.028	0.992	1.685	3.279	3.355	2.180	1.232
180	1.018	0.990	1.735	3.493	3.575	2.352	1.244
240	1.077	1.047	1.836	3.702	3.790	2.532	1.317
300	1.135	1.104	1.935	3.905	4.000	2.711	1.388
360	1.191	1.159	2.031	4.103	4.204	2.890	1.458
420	1.246	1.213	2.124	4.296	4.402	3.067	1.525
480	1.299	1.265	2.215	4.483	4.596	3.244	1.591
540	1.350	1.316	2.303	4.665	4.783	3.420	1.655
600	1.401	1.365	2.388	4.842	4.966	3.596	1.717
660	1.449	1.413	2.471	5.013	5.143	3.770	1.777
720	1.496	1.460	2.551	5.179	5.314	3.943	1.835

Pollutant Name: Carbon Monoxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	1.114	1.191	2.207	8.041	7.377	5.805	1.686
10	1.886	2.063	3.687	11.524	10.953	5.461	2.720
20	3.344	3.709	6.476	18.096	17.691	4.887	4.672
30	4.687	5.225	9.035	24.144	23.877	4.463	6.469
40	5.913	6.611	11.366	29.667	29.512	4.188	8.110
50	7.024	7.867	13.467	34.665	34.595	4.062	9.596
60	8.020	8.994	15.339	39.139	39.127	4.086	10.926
120	10.928	12.079	19.214	46.480	46.011	6.744	14.251
180	10.267	11.508	19.176	49.299	48.565	8.872	13.902
240	10.789	12.097	20.076	51.998	51.026	10.882	14.619
300	11.284	12.653	20.939	54.576	53.394	12.666	15.300
360	11.750	13.175	21.767	57.033	55.670	14.226	15.944
420	12.188	13.664	22.558	59.370	57.853	15.561	16.551
480	12.598	14.120	23.313	61.585	59.943	16.672	17.122
540	12.980	14.542	24.031	63.680	61.941	17.557	17.655
600	13.333	14.931	24.714	65.654	63.846	18.217	18.152
660	13.658	15.286	25.360	67.507	65.658	18.652	18.612
720	13.955	15.608	25.970	69.239	67.378	18.862	19.035

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.249	0.361	0.640	1.046	1.202	0.229	0.371
10	0.311	0.435	0.842	1.552	1.792	0.253	0.478
20	0.420	0.566	1.197	2.443	2.828	0.296	0.667
30	0.510	0.674	1.488	3.169	3.673	0.333	0.822
40	0.580	0.759	1.715	3.731	4.326	0.364	0.943
50	0.631	0.821	1.876	4.128	4.787	0.389	1.029
60	0.662	0.859	1.974	4.361	5.058	0.408	1.082
120	0.680	0.891	2.017	4.393	5.095	0.411	1.107
180	0.682	0.893	2.014	4.375	5.074	0.402	1.108
240	0.677	0.887	2.002	4.348	5.044	0.390	1.100
300	0.670	0.878	1.984	4.312	5.003	0.376	1.090
360	0.662	0.866	1.960	4.266	4.951	0.358	1.076
420	0.651	0.851	1.932	4.212	4.890	0.337	1.060
480	0.638	0.833	1.899	4.149	4.818	0.314	1.040
540	0.623	0.813	1.860	4.077	4.735	0.287	1.017
600	0.606	0.789	1.816	3.995	4.643	0.258	0.992
660	0.587	0.763	1.767	3.905	4.540	0.225	0.963
720	0.565	0.733	1.712	3.805	4.426	0.190	0.931

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	9.824	12.255	14.928	11.059	12.004	28.521	11.221
10	12.966	15.707	21.184	15.137	16.928	31.222	14.862
20	19.459	22.926	33.904	23.197	26.665	36.476	22.362
30	26.233	30.562	46.904	31.130	36.256	41.534	30.153
40	33.289	38.618	60.183	38.935	45.699	46.396	38.237
50	40.627	47.092	73.741	46.612	54.996	51.062	46.611
60	48.245	55.985	87.579	54.163	64.147	55.532	55.277
120	93.384	111.494	162.119	87.242	104.157	76.355	105.792
180	107.648	128.244	188.003	99.638	119.576	77.483	121.907
240	121.420	144.495	212.780	111.304	134.086	78.549	137.443
300	134.699	160.247	236.449	122.239	147.686	79.551	152.402
360	147.486	175.502	259.010	132.443	160.378	80.490	166.783
420	159.781	190.257	280.463	141.917	172.160	81.366	180.586
480	171.583	204.515	300.808	150.660	183.033	82.178	193.812
540	182.894	218.273	320.046	158.671	192.997	82.927	206.459
600	193.712	231.533	338.177	165.953	202.052	83.612	218.528
660	204.038	244.295	355.199	172.503	210.198	84.234	230.019
720	213.871	256.558	371.114	178.322	217.434	84.793	240.932

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.001	0.001	0.001	0.000
30	0.000	0.000	0.001	0.001	0.001	0.001	0.000
40	0.000	0.001	0.001	0.001	0.001	0.001	0.001
50	0.001	0.001	0.001	0.001	0.001	0.001	0.001
60	0.001	0.001	0.001	0.001	0.001	0.001	0.001
120	0.001	0.001	0.002	0.002	0.002	0.001	0.001
180	0.001	0.001	0.002	0.002	0.002	0.001	0.001
240	0.001	0.002	0.002	0.002	0.002	0.001	0.002
300	0.002	0.002	0.003	0.002	0.002	0.001	0.002
360	0.002	0.002	0.003	0.002	0.003	0.001	0.002
420	0.002	0.002	0.003	0.003	0.003	0.001	0.002
480	0.002	0.002	0.003	0.003	0.003	0.001	0.002
540	0.002	0.002	0.004	0.003	0.003	0.001	0.002
600	0.002	0.003	0.004	0.003	0.003	0.001	0.002
660	0.002	0.003	0.004	0.003	0.003	0.001	0.003
720	0.002	0.003	0.004	0.003	0.003	0.001	0.003

Pollutant Name: PM10 Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.001	0.001	0.001	0.001	0.001	0.017	0.001
10	0.001	0.002	0.002	0.001	0.002	0.015	0.002
20	0.002	0.003	0.004	0.002	0.003	0.011	0.003
30	0.003	0.005	0.005	0.003	0.004	0.009	0.004
40	0.004	0.006	0.006	0.003	0.005	0.007	0.005
50	0.005	0.007	0.008	0.004	0.006	0.005	0.006
60	0.006	0.008	0.009	0.004	0.006	0.004	0.007
120	0.008	0.012	0.012	0.006	0.009	0.011	0.010
180	0.009	0.013	0.013	0.007	0.009	0.017	0.010
240	0.009	0.013	0.013	0.007	0.010	0.022	0.011
300	0.010	0.014	0.014	0.007	0.010	0.027	0.011
360	0.010	0.014	0.015	0.008	0.011	0.031	0.012
420	0.010	0.015	0.015	0.008	0.011	0.035	0.012
480	0.011	0.015	0.015	0.008	0.012	0.038	0.013
540	0.011	0.016	0.016	0.008	0.012	0.040	0.013
600	0.011	0.016	0.016	0.009	0.012	0.042	0.013
660	0.012	0.017	0.017	0.009	0.013	0.043	0.014
720	0.012	0.017	0.017	0.009	0.013	0.043	0.014

```
Title    : Orange County 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                              Orange Count          County Average

                             Table   4:  Hot Soak Emissions (grams/trip)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.049	0.044	0.036	0.023	0.106	0.158	0.045
10	0.094	0.084	0.070	0.044	0.199	0.297	0.086
20	0.173	0.155	0.130	0.082	0.350	0.527	0.159
30	0.241	0.217	0.184	0.115	0.466	0.705	0.223
40	0.271	0.245	0.209	0.130	0.514	0.780	0.251

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

```
Title    : Orange County 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                              Orange Count          County Average

                             Table  5a:  Partial Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL
```

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
70	0.018	0.017	0.015	0.000	0.000	0.087	0.018

```
Title    : Orange County 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                             Table  5b:  Multi-Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.002    0.002    0.001    0.000    0.000    0.008    0.002
```

```
Title    : Orange County 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                             Table  6a:  Partial Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.058    0.053    0.043    0.004    0.003    0.105    0.054
```

```
Title    : Orange County 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                             Table  6b:  Multi-Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.005    0.004    0.003    0.000    0.001    0.008    0.004
```

```
Title    : Orange County 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                              Table   7:  Estimated Travel Fractions

     Pollutant Name:                            Temperature: ALL   Relative Humidity: ALL
```

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
%VMT	0.579	0.280	0.088	0.047	0.003	0.003	1.000
%TRIP	0.556	0.264	0.117	0.058	0.000	0.005	1.000
%VEH	0.595	0.282	0.081	0.026	0.001	0.015	1.000

```
Title    : Orange County 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                              Table   8:  Evaporative Running Loss Emissions (grams/minute)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.034	0.444	0.418	0.252	0.598	0.168	0.195
2	0.044	0.233	0.220	0.138	0.345	0.201	0.118
3	0.050	0.165	0.156	0.100	0.261	0.217	0.095
4	0.055	0.132	0.125	0.081	0.219	0.227	0.085
5	0.058	0.113	0.107	0.070	0.195	0.235	0.079
10	0.065	0.080	0.074	0.048	0.146	0.255	0.070
15	0.067	0.073	0.067	0.041	0.131	0.267	0.069
20	0.069	0.073	0.066	0.038	0.123	0.277	0.070
25	0.071	0.076	0.068	0.036	0.120	0.286	0.071
30	0.070	0.075	0.067	0.035	0.119	0.283	0.070
35	0.069	0.074	0.065	0.034	0.118	0.281	0.069
40	0.068	0.073	0.065	0.034	0.117	0.278	0.069
45	0.068	0.072	0.064	0.033	0.116	0.276	0.068
50	0.066	0.071	0.063	0.033	0.115	0.269	0.066
55	0.064	0.070	0.062	0.032	0.114	0.261	0.065
60	0.062	0.069	0.061	0.032	0.112	0.254	0.064

```
Title    : Orange County 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                        Table   1:  Running Exhaust Emissions (grams/mile)

     Pollutant Name: Reactive Org Gases       Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.383	0.449	0.626	1.688	6.966	4.913	0.525
10	0.249	0.297	0.416	1.216	4.654	3.789	0.352
15	0.171	0.206	0.290	0.910	3.240	3.067	0.248
20	0.124	0.150	0.213	0.706	2.351	2.605	0.184
25	0.095	0.115	0.163	0.566	1.778	2.323	0.143
30	0.076	0.093	0.131	0.468	1.400	2.175	0.117
35	0.065	0.080	0.111	0.399	1.148	2.139	0.100
40	0.058	0.071	0.098	0.350	0.981	2.210	0.090
45	0.054	0.067	0.091	0.316	0.872	2.396	0.085
50	0.054	0.066	0.089	0.294	0.808	2.727	0.085
55	0.056	0.069	0.091	0.280	0.780	3.255	0.088
60	0.062	0.075	0.098	0.275	0.784	4.073	0.097
65	0.072	0.087	0.110	0.278	0.821	5.338	0.112

```
     Pollutant Name: Carbon Monoxide          Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	4.707	6.265	6.627	16.395	56.810	31.238	6.151
10	4.081	5.355	5.456	11.044	37.537	25.937	5.088
15	3.601	4.672	4.637	7.835	26.229	22.570	4.341
20	3.221	4.146	4.042	5.854	19.379	20.565	3.797
25	2.916	3.734	3.597	4.606	15.139	19.616	3.388
30	2.669	3.407	3.259	3.815	12.504	19.597	3.077
35	2.467	3.148	3.003	3.328	10.918	20.531	2.840
40	2.305	2.948	2.813	3.056	10.078	22.593	2.666
45	2.178	2.800	2.682	2.956	9.834	26.160	2.547
50	2.087	2.703	2.610	3.012	10.144	31.923	2.486
55	2.032	2.663	2.602	3.233	11.060	41.106	2.491
60	2.022	2.692	2.675	3.659	12.748	55.891	2.581
65	2.072	2.813	2.859	4.364	15.530	80.256	2.794

```
     Pollutant Name: Oxides of Nitrogen       Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.375	0.616	1.194	10.965	21.075	1.017	1.108
10	0.326	0.529	1.022	9.183	16.607	1.022	0.937
15	0.289	0.465	0.899	7.970	13.792	1.034	0.819
20	0.262	0.418	0.813	7.165	12.036	1.052	0.737
25	0.242	0.385	0.755	6.667	11.001	1.076	0.683
30	0.227	0.361	0.718	6.415	10.499	1.104	0.651
35	0.218	0.347	0.700	6.380	10.436	1.137	0.638
40	0.213	0.339	0.699	6.556	10.790	1.173	0.643
45	0.212	0.338	0.714	6.960	11.601	1.213	0.666
50	0.214	0.345	0.748	7.635	12.986	1.257	0.710
55	0.221	0.358	0.803	8.658	15.169	1.305	0.781
60	0.232	0.381	0.887	10.157	18.546	1.357	0.886
65	0.248	0.413	1.008	12.336	23.809	1.415	1.040

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	976.242	1202.430	1713.230	2038.904	2588.391	242.717	1159.437
10	736.465	907.628	1264.143	1904.767	2176.714	205.117	891.372
15	577.210	711.791	975.917	1825.555	1933.604	177.260	714.776
20	469.837	579.739	786.858	1777.323	1785.578	156.611	596.471
25	397.105	490.280	661.535	1747.349	1693.583	141.469	516.727
30	348.453	430.435	579.105	1728.674	1636.269	130.702	463.586
35	317.402	392.236	527.187	1717.437	1601.782	123.591	429.769
40	300.085	370.927	498.588	1711.522	1583.629	119.735	410.961
45	294.427	363.960	489.544	1709.889	1578.617	119.012	404.860
50	299.730	370.474	498.865	1712.260	1585.893	121.586	410.705
55	316.532	391.138	527.666	1719.039	1606.699	127.956	429.115
60	346.718	428.270	579.635	1731.432	1644.733	139.081	462.223
65	393.897	486.315	661.895	1751.806	1707.263	156.597	514.124

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.009	0.012	0.017	0.020	0.026	0.003	0.011
10	0.007	0.009	0.012	0.018	0.022	0.003	0.009
15	0.006	0.007	0.009	0.018	0.019	0.002	0.007
20	0.005	0.006	0.008	0.017	0.017	0.002	0.006
25	0.004	0.005	0.006	0.017	0.016	0.002	0.005
30	0.003	0.004	0.006	0.017	0.016	0.002	0.004
35	0.003	0.004	0.005	0.016	0.016	0.002	0.004
40	0.003	0.004	0.005	0.016	0.015	0.002	0.004
45	0.003	0.004	0.005	0.016	0.015	0.002	0.004
50	0.003	0.004	0.005	0.016	0.015	0.002	0.004
55	0.003	0.004	0.005	0.016	0.016	0.002	0.004
60	0.003	0.004	0.006	0.017	0.016	0.002	0.004
65	0.004	0.005	0.006	0.017	0.017	0.003	0.005

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.051	0.084	0.098	0.503	0.577	0.052	0.088
10	0.033	0.055	0.065	0.394	0.416	0.041	0.061
15	0.023	0.038	0.046	0.315	0.310	0.034	0.045
20	0.017	0.028	0.034	0.258	0.240	0.029	0.034
25	0.013	0.021	0.027	0.216	0.193	0.026	0.027
30	0.010	0.017	0.022	0.185	0.160	0.025	0.023
35	0.009	0.015	0.018	0.162	0.138	0.025	0.019
40	0.008	0.013	0.016	0.145	0.123	0.026	0.017
45	0.007	0.012	0.015	0.133	0.114	0.028	0.016
50	0.007	0.012	0.015	0.125	0.109	0.031	0.016
55	0.008	0.013	0.015	0.119	0.108	0.037	0.016
60	0.008	0.014	0.016	0.117	0.111	0.046	0.016
65	0.009	0.016	0.018	0.117	0.118	0.060	0.018

Pollutant Name: PM10 - Tire Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.008	0.008	0.009	0.025	0.010	0.004	0.009
10	0.008	0.008	0.009	0.025	0.010	0.004	0.009
15	0.008	0.008	0.009	0.025	0.010	0.004	0.009
20	0.008	0.008	0.009	0.025	0.010	0.004	0.009
25	0.008	0.008	0.009	0.025	0.010	0.004	0.009
30	0.008	0.008	0.009	0.025	0.010	0.004	0.009
35	0.008	0.008	0.009	0.025	0.010	0.004	0.009
40	0.008	0.008	0.009	0.025	0.010	0.004	0.009
45	0.008	0.008	0.009	0.025	0.010	0.004	0.009
50	0.008	0.008	0.009	0.025	0.010	0.004	0.009
55	0.008	0.008	0.009	0.025	0.010	0.004	0.009
60	0.008	0.008	0.009	0.025	0.010	0.004	0.009
65	0.008	0.008	0.009	0.025	0.010	0.004	0.009

Pollutant Name: PM10 - Break Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.013	0.013	0.013	0.013	0.013	0.013	0.013
10	0.013	0.013	0.013	0.013	0.013	0.013	0.013
15	0.013	0.013	0.013	0.013	0.013	0.013	0.013
20	0.013	0.013	0.013	0.013	0.013	0.013	0.013
25	0.013	0.013	0.013	0.013	0.013	0.013	0.013
30	0.013	0.013	0.013	0.013	0.013	0.013	0.013
35	0.013	0.013	0.013	0.013	0.013	0.013	0.013
40	0.013	0.013	0.013	0.013	0.013	0.013	0.013
45	0.013	0.013	0.013	0.013	0.013	0.013	0.013
50	0.013	0.013	0.013	0.013	0.013	0.013	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013	0.013
60	0.013	0.013	0.013	0.013	0.013	0.013	0.013
65	0.013	0.013	0.013	0.013	0.013	0.013	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	8.981	7.253	4.984	3.354	3.248	27.401	8.146
10	11.898	9.607	6.713	5.043	4.884	32.779	10.793
15	15.171	12.250	8.698	7.176	6.953	38.097	13.767
20	18.629	15.042	10.837	9.666	9.371	43.041	16.913
25	22.034	17.792	12.982	12.326	11.957	47.263	20.012
30	25.107	20.274	14.945	14.877	14.444	50.409	22.812
35	27.567	22.260	16.529	16.996	16.517	52.144	25.051
40	29.168	23.553	17.559	18.380	17.879	52.197	26.505
45	29.746	24.019	17.915	18.812	18.318	50.405	27.020
50	29.241	23.610	17.557	18.225	17.763	46.767	26.542
55	27.711	22.373	16.530	16.710	16.303	41.489	25.127
60	25.319	20.439	14.958	14.501	14.161	35.009	22.926
65	22.304	18.002	13.014	11.910	11.641	27.956	20.161

Pollutant Name: Diesel - mi/gal   Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	27.790	29.053	21.790	5.329	3.789	0.000	8.668
10	27.790	29.053	21.790	5.329	3.789	0.000	8.668
15	27.790	29.053	21.790	5.329	3.789	0.000	8.668
20	27.790	29.053	21.790	5.329	3.789	0.000	8.668
25	27.790	29.053	21.790	5.329	3.789	0.000	8.668
30	27.790	29.053	21.790	5.329	3.789	0.000	8.668
35	27.790	29.053	21.790	5.329	3.789	0.000	8.668
40	27.790	29.053	21.790	5.329	3.789	0.000	8.668
45	27.790	29.053	21.790	5.329	3.789	0.000	8.668
50	27.790	29.053	21.790	5.329	3.789	0.000	8.668
55	27.790	29.053	21.790	5.329	3.789	0.000	8.668
60	27.790	29.053	21.790	5.329	3.789	0.000	8.668
65	27.790	29.053	21.790	5.329	3.789	0.000	8.668

Title   : Orange County 2010
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area   : Orange County
****

Year:2010 -- Model Years 1965 to 2010 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Apr 23 2003

County Average   Orange Count   County Average

Table   2: Starting Emissions (grams/trip)

Pollutant Name: Reactive Org Gases   Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.072	0.075	0.145	0.417	0.646	1.126	0.107
10	0.125	0.131	0.256	0.621	0.917	1.199	0.177
20	0.225	0.238	0.464	1.002	1.425	1.357	0.308
30	0.315	0.334	0.651	1.345	1.887	1.536	0.427
40	0.396	0.420	0.818	1.652	2.302	1.734	0.533
50	0.467	0.496	0.964	1.922	2.672	1.952	0.627
60	0.526	0.560	1.088	2.134	2.959	2.083	0.705
120	0.674	0.720	1.358	2.335	3.216	2.149	0.873
180	0.664	0.714	1.387	2.485	3.425	2.272	0.879
240	0.703	0.756	1.468	2.630	3.628	2.435	0.931
300	0.741	0.797	1.547	2.772	3.827	2.597	0.981
360	0.778	0.837	1.625	2.910	4.020	2.758	1.031
420	0.814	0.877	1.701	3.043	4.207	2.917	1.079
480	0.850	0.915	1.775	3.173	4.389	3.075	1.126
540	0.884	0.952	1.847	3.298	4.566	3.231	1.171
600	0.918	0.989	1.917	3.420	4.738	3.386	1.216
660	0.950	1.024	1.985	3.537	4.904	3.539	1.259
720	0.982	1.059	2.051	3.650	5.065	3.691	1.301

Pollutant Name: Carbon Monoxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.673	0.798	1.417	5.103	6.486	4.810	1.075
10	1.198	1.442	2.508	7.864	9.853	4.778	1.829
20	2.193	2.662	4.571	13.061	16.193	4.771	3.254
30	3.114	3.790	6.473	17.823	22.006	4.842	4.570
40	3.962	4.828	8.214	22.150	27.293	4.990	5.776
50	4.735	5.774	9.795	26.043	32.054	5.215	6.873
60	5.434	6.630	11.214	29.500	36.289	5.518	7.861
120	7.653	9.188	14.679	34.741	42.729	8.381	10.502
180	7.170	8.713	14.437	36.494	44.964	9.711	10.189
240	7.582	9.208	15.192	38.196	47.128	11.371	10.746
300	7.963	9.666	15.900	39.848	49.221	12.857	11.267
360	8.314	10.089	16.562	41.450	51.244	14.168	11.752
420	8.634	10.474	17.178	43.002	53.197	15.306	12.202
480	8.924	10.824	17.748	44.504	55.078	16.269	12.616
540	9.184	11.137	18.271	45.956	56.890	17.058	12.994
600	9.413	11.414	18.748	47.358	58.631	17.673	13.336
660	9.611	11.654	19.179	48.710	60.301	18.113	13.642
720	9.780	11.858	19.563	50.012	61.901	18.379	13.913

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.211	0.323	0.740	0.783	1.231	0.205	0.339
10	0.249	0.372	0.895	1.168	1.838	0.234	0.414
20	0.316	0.460	1.168	1.846	2.905	0.285	0.548
30	0.372	0.533	1.393	2.398	3.775	0.328	0.657
40	0.416	0.590	1.569	2.825	4.448	0.363	0.743
50	0.448	0.633	1.698	3.127	4.923	0.391	0.806
60	0.468	0.660	1.777	3.303	5.202	0.410	0.844
120	0.488	0.693	1.845	3.328	5.240	0.413	0.873
180	0.490	0.695	1.844	3.314	5.219	0.406	0.874
240	0.486	0.690	1.831	3.295	5.188	0.395	0.868
300	0.481	0.683	1.813	3.268	5.146	0.383	0.859
360	0.474	0.673	1.790	3.235	5.094	0.367	0.848
420	0.466	0.660	1.760	3.195	5.031	0.350	0.834
480	0.456	0.645	1.725	3.148	4.958	0.329	0.818
540	0.444	0.628	1.684	3.095	4.874	0.306	0.798
600	0.430	0.608	1.637	3.035	4.780	0.281	0.776
660	0.415	0.585	1.584	2.968	4.675	0.252	0.751
720	0.399	0.560	1.525	2.894	4.560	0.222	0.724

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	10.624	13.177	16.687	7.244	10.609	24.032	11.913
10	13.054	16.051	21.734	10.758	15.440	26.608	14.844
20	18.247	22.230	32.267	17.712	24.999	31.631	21.053
30	23.887	28.982	43.384	24.568	34.420	36.483	27.724
40	29.972	36.306	55.086	31.326	43.704	41.166	34.857
50	36.504	44.203	67.374	37.987	52.850	45.678	42.452
60	43.482	52.672	80.246	44.550	61.857	50.019	50.510
120	90.710	110.983	159.751	73.170	101.176	70.039	103.423
180	103.988	127.134	184.202	84.615	116.697	72.173	118.671
240	116.974	142.957	207.896	95.385	131.302	74.184	133.539
300	129.668	158.451	230.833	105.480	144.992	76.071	148.027
360	142.069	173.617	253.014	114.900	157.767	77.836	162.134
420	154.178	188.455	274.437	123.645	169.626	79.477	175.862
480	165.994	202.964	295.103	131.715	180.570	80.995	189.210
540	177.518	217.145	315.012	139.109	190.599	82.390	202.177
600	188.749	230.997	334.163	145.829	199.712	83.661	214.765
660	199.689	244.522	352.558	151.874	207.910	84.809	226.973
720	210.335	257.717	370.196	157.243	215.192	85.834	238.800

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.001	0.000	0.000
30	0.000	0.000	0.001	0.001	0.001	0.001	0.000
40	0.000	0.000	0.001	0.001	0.001	0.001	0.000
50	0.000	0.001	0.001	0.001	0.001	0.001	0.001
60	0.001	0.001	0.001	0.001	0.001	0.001	0.001
120	0.001	0.001	0.002	0.001	0.002	0.001	0.001
180	0.001	0.001	0.002	0.002	0.002	0.001	0.001
240	0.001	0.002	0.002	0.002	0.002	0.001	0.002
300	0.001	0.002	0.003	0.002	0.002	0.001	0.002
360	0.002	0.002	0.003	0.002	0.003	0.001	0.002
420	0.002	0.002	0.003	0.002	0.003	0.001	0.002
480	0.002	0.002	0.003	0.002	0.003	0.001	0.002
540	0.002	0.002	0.003	0.002	0.003	0.001	0.002
600	0.002	0.002	0.004	0.002	0.003	0.001	0.002
660	0.002	0.003	0.004	0.002	0.003	0.001	0.002
720	0.002	0.003	0.004	0.002	0.003	0.001	0.003

Pollutant Name: PM10 Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.001	0.001	0.001	0.001	0.001	0.013	0.001
10	0.001	0.002	0.002	0.001	0.002	0.012	0.002
20	0.002	0.004	0.004	0.002	0.003	0.009	0.003
30	0.003	0.006	0.006	0.002	0.004	0.007	0.004
40	0.004	0.007	0.008	0.003	0.005	0.006	0.005
50	0.005	0.009	0.009	0.004	0.006	0.004	0.007
60	0.006	0.010	0.011	0.004	0.007	0.004	0.008
120	0.009	0.015	0.015	0.006	0.009	0.009	0.011
180	0.010	0.016	0.016	0.006	0.010	0.014	0.012
240	0.010	0.017	0.017	0.006	0.010	0.019	0.013
300	0.011	0.017	0.018	0.007	0.011	0.023	0.013
360	0.011	0.018	0.019	0.007	0.011	0.026	0.014
420	0.012	0.019	0.019	0.007	0.011	0.029	0.014
480	0.012	0.020	0.020	0.007	0.012	0.031	0.015
540	0.012	0.020	0.020	0.007	0.012	0.033	0.015
600	0.013	0.021	0.021	0.008	0.012	0.034	0.016
660	0.013	0.021	0.021	0.008	0.013	0.035	0.016
720	0.013	0.021	0.022	0.008	0.013	0.035	0.016

```
Title    : Orange County 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                              Orange Count         County Average

                             Table   4:  Hot Soak Emissions (grams/trip)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL

     Time
      min       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

        5      0.037    0.037    0.029    0.015    0.091    0.084    0.035
       10      0.071    0.071    0.056    0.028    0.171    0.161    0.067
       20      0.132    0.132    0.105    0.053    0.302    0.292    0.125
       30      0.186    0.186    0.149    0.075    0.402    0.402    0.176
       40      0.210    0.211    0.170    0.085    0.443    0.451    0.199

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes
(about 25% of in-use trips).
```

```
Title    : Orange County 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                              Orange Count         County Average

                             Table  5a:  Partial Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.001    0.001    0.001    0.000    0.000    0.084    0.002
```

```
Title    : Orange County 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                              Orange Count         County Average

                             Table  5b:  Multi-Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.000    0.000    0.000    0.000    0.000    0.008    0.000
```

```
Title    : Orange County 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count          County Average

                             Table  6a:  Partial Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.049    0.050    0.043    0.003    0.003    0.079    0.048
```

```
Title    : Orange County 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count          County Average

                             Table  6b:  Multi-Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.004    0.004    0.003    0.000    0.001    0.007    0.004
```

```
Title    : Orange County 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count          County Average

                             Table   7:  Estimated Travel Fractions

     Pollutant Name:                           Temperature: ALL   Relative Humidity: ALL


                LDA      LDT      MDT      HDT      UBUS     MCY      ALL

    %VMT       0.576    0.279    0.088    0.050    0.003    0.004    1.000
    %TRIP      0.547    0.269    0.121    0.058    0.001    0.005    1.000
    %VEH       0.585    0.287    0.084    0.027    0.001    0.016    1.000
```

```
Title    : Orange County 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                               Orange Count         County Average

                        Table   8:  Evaporative Running Loss Emissions (grams/minute)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.023	0.529	0.518	0.285	0.819	0.052	0.223
2	0.027	0.272	0.266	0.149	0.445	0.089	0.124
3	0.031	0.188	0.185	0.104	0.321	0.108	0.093
4	0.035	0.148	0.145	0.082	0.260	0.119	0.079
5	0.037	0.124	0.122	0.069	0.223	0.126	0.071
10	0.041	0.080	0.078	0.042	0.151	0.142	0.056
15	0.043	0.069	0.065	0.034	0.128	0.149	0.052
20	0.044	0.065	0.061	0.030	0.117	0.153	0.051
25	0.045	0.064	0.060	0.027	0.111	0.156	0.051
30	0.044	0.063	0.059	0.026	0.110	0.154	0.051
35	0.044	0.062	0.058	0.026	0.109	0.152	0.050
40	0.043	0.062	0.057	0.025	0.109	0.151	0.049
45	0.043	0.061	0.056	0.025	0.108	0.149	0.049
50	0.042	0.060	0.055	0.024	0.107	0.146	0.048
55	0.041	0.059	0.055	0.024	0.106	0.142	0.047
60	0.040	0.059	0.054	0.023	0.105	0.139	0.046

```
Title    : Orange County 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                               Orange Count         County Average

                        Table   1:  Running Exhaust Emissions (grams/mile)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.057	0.098	0.151	0.464	2.262	4.672	0.116
10	0.036	0.062	0.097	0.357	1.530	3.505	0.078
15	0.024	0.042	0.067	0.282	1.079	2.768	0.056
20	0.017	0.030	0.049	0.229	0.793	2.300	0.042
25	0.013	0.023	0.037	0.190	0.606	2.013	0.034
30	0.010	0.018	0.030	0.162	0.483	1.856	0.028
35	0.009	0.015	0.025	0.141	0.400	1.802	0.024
40	0.008	0.013	0.022	0.126	0.345	1.844	0.022
45	0.007	0.012	0.020	0.115	0.310	1.987	0.022
50	0.007	0.012	0.020	0.107	0.290	2.253	0.022
55	0.007	0.013	0.020	0.103	0.281	2.687	0.023
60	0.008	0.014	0.022	0.100	0.285	3.368	0.026
65	0.009	0.016	0.025	0.101	0.299	4.434	0.031

Pollutant Name: Carbon Monoxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	1.002	1.611	2.103	4.652	22.477	22.052	1.564
10	0.910	1.454	1.857	3.181	14.813	18.829	1.346
15	0.829	1.320	1.660	2.282	10.326	16.657	1.183
20	0.758	1.203	1.498	1.717	7.614	15.234	1.057
25	0.696	1.101	1.363	1.355	5.938	14.397	0.956
30	0.641	1.013	1.249	1.121	4.897	14.077	0.874
35	0.592	0.935	1.150	0.973	4.271	14.281	0.808
40	0.549	0.867	1.066	0.886	3.938	15.094	0.753
45	0.510	0.807	0.993	0.846	3.840	16.709	0.711
50	0.476	0.754	0.930	0.847	3.958	19.479	0.679
55	0.446	0.708	0.877	0.891	4.314	24.033	0.661
60	0.419	0.668	0.833	0.983	4.971	31.492	0.658
65	0.395	0.633	0.798	1.138	6.056	43.906	0.679

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.075	0.148	0.271	1.694	10.475	1.117	0.221
10	0.065	0.127	0.232	1.416	8.353	1.067	0.187
15	0.058	0.112	0.204	1.227	7.023	1.034	0.163
20	0.052	0.100	0.184	1.102	6.201	1.014	0.146
25	0.048	0.092	0.170	1.024	5.724	1.006	0.135
30	0.045	0.085	0.160	0.984	5.502	1.008	0.128
35	0.042	0.081	0.155	0.978	5.491	1.019	0.125
40	0.041	0.079	0.153	1.005	5.680	1.038	0.125
45	0.040	0.078	0.155	1.067	6.088	1.066	0.129
50	0.040	0.078	0.160	1.171	6.771	1.103	0.136
55	0.041	0.080	0.170	1.330	7.836	1.150	0.149
60	0.042	0.084	0.185	1.562	9.473	1.208	0.167
65	0.045	0.090	0.208	1.900	12.014	1.279	0.196

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	962.880	1212.746	1702.797	2053.778	2441.825	266.223	1148.418
10	726.175	914.725	1262.912	1912.711	2026.226	221.935	881.133
15	568.980	716.784	978.300	1829.406	1780.801	190.630	704.813
20	463.006	583.329	790.368	1778.682	1631.364	168.667	586.568
25	391.227	492.929	665.128	1747.159	1538.492	153.733	506.801
30	343.217	432.459	582.405	1727.519	1480.633	144.401	453.615
35	312.579	393.867	530.131	1715.702	1445.817	139.873	419.760
40	295.494	372.343	501.246	1709.481	1427.491	139.855	400.931
45	289.916	365.310	492.038	1707.764	1422.432	144.517	394.831
50	295.153	371.900	501.309	1710.257	1429.777	154.545	400.698
55	311.736	392.782	530.129	1717.387	1450.781	171.285	419.147
60	341.521	430.298	582.067	1730.420	1489.177	197.035	452.302
65	388.069	488.933	664.015	1751.847	1552.304	235.564	504.235

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.009	0.012	0.016	0.020	0.024	0.003	0.011
10	0.007	0.009	0.012	0.018	0.020	0.003	0.008
15	0.005	0.007	0.009	0.017	0.017	0.002	0.007
20	0.004	0.006	0.008	0.017	0.016	0.002	0.006
25	0.004	0.005	0.006	0.017	0.015	0.002	0.005
30	0.003	0.004	0.006	0.017	0.014	0.002	0.004
35	0.003	0.004	0.005	0.016	0.014	0.002	0.004
40	0.003	0.004	0.005	0.016	0.014	0.002	0.004
45	0.003	0.004	0.005	0.016	0.014	0.002	0.004
50	0.003	0.004	0.005	0.016	0.014	0.002	0.004
55	0.003	0.004	0.005	0.016	0.014	0.002	0.004
60	0.003	0.004	0.006	0.017	0.014	0.003	0.004
65	0.004	0.005	0.006	0.017	0.015	0.003	0.005

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.053	0.096	0.113	0.203	0.345	0.030	0.078
10	0.034	0.062	0.073	0.159	0.247	0.024	0.052
15	0.024	0.042	0.050	0.127	0.184	0.019	0.036
20	0.017	0.030	0.037	0.104	0.142	0.017	0.027
25	0.013	0.023	0.028	0.087	0.113	0.015	0.021
30	0.010	0.019	0.022	0.075	0.094	0.014	0.017
35	0.009	0.016	0.019	0.065	0.081	0.014	0.014
40	0.008	0.014	0.017	0.058	0.072	0.014	0.013
45	0.007	0.013	0.016	0.053	0.066	0.016	0.012
50	0.007	0.013	0.015	0.050	0.063	0.018	0.012
55	0.008	0.014	0.016	0.048	0.063	0.021	0.012
60	0.008	0.015	0.017	0.047	0.065	0.026	0.013
65	0.010	0.017	0.020	0.047	0.069	0.034	0.015

Pollutant Name: PM10 - Tire Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.008	0.008	0.009	0.026	0.010	0.004	0.009
10	0.008	0.008	0.009	0.026	0.010	0.004	0.009
15	0.008	0.008	0.009	0.026	0.010	0.004	0.009
20	0.008	0.008	0.009	0.026	0.010	0.004	0.009
25	0.008	0.008	0.009	0.026	0.010	0.004	0.009
30	0.008	0.008	0.009	0.026	0.010	0.004	0.009
35	0.008	0.008	0.009	0.026	0.010	0.004	0.009
40	0.008	0.008	0.009	0.026	0.010	0.004	0.009
45	0.008	0.008	0.009	0.026	0.010	0.004	0.009
50	0.008	0.008	0.009	0.026	0.010	0.004	0.009
55	0.008	0.008	0.009	0.026	0.010	0.004	0.009
60	0.008	0.008	0.009	0.026	0.010	0.004	0.009
65	0.008	0.008	0.009	0.026	0.010	0.004	0.009

Pollutant Name: PM10 - Break Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.013	0.013	0.013	0.013	0.013	0.013	0.013
10	0.013	0.013	0.013	0.013	0.013	0.013	0.013
15	0.013	0.013	0.013	0.013	0.013	0.013	0.013
20	0.013	0.013	0.013	0.013	0.013	0.013	0.013
25	0.013	0.013	0.013	0.013	0.013	0.013	0.013
30	0.013	0.013	0.013	0.013	0.013	0.013	0.013
35	0.013	0.013	0.013	0.013	0.013	0.013	0.013
40	0.013	0.013	0.013	0.013	0.013	0.013	0.013
45	0.013	0.013	0.013	0.013	0.013	0.013	0.013
50	0.013	0.013	0.013	0.013	0.013	0.013	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013	0.013
60	0.013	0.013	0.013	0.013	0.013	0.013	0.013
65	0.013	0.013	0.013	0.013	0.013	0.013	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	9.183	7.283	5.116	3.509	3.418	26.776	8.272
10	12.173	9.653	6.862	5.274	5.138	32.314	10.968
15	15.532	12.316	8.854	7.503	7.312	37.735	13.999
20	19.083	15.131	10.990	10.103	9.848	42.669	17.205
25	22.580	17.903	13.122	12.877	12.555	46.729	20.364
30	25.735	20.405	15.066	15.533	15.151	49.555	23.216
35	28.257	22.405	16.630	17.735	17.307	50.851	25.494
40	29.893	23.703	17.645	19.165	18.711	50.430	26.968
45	30.474	24.164	17.997	19.602	19.147	48.243	27.483
50	29.940	23.743	17.647	18.976	18.545	44.409	26.987
55	28.356	22.488	16.639	17.387	17.000	39.218	25.539
60	25.891	20.534	15.091	15.079	14.750	33.115	23.295
65	22.793	18.078	13.171	12.377	12.112	26.653	20.481

Pollutant Name: Diesel - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	29.156	29.156	19.980	5.295	4.250	0.000	6.748
10	29.156	29.156	19.980	5.295	4.250	0.000	6.748
15	29.156	29.156	19.980	5.295	4.250	0.000	6.748
20	29.156	29.156	19.980	5.295	4.250	0.000	6.748
25	29.156	29.156	19.980	5.295	4.250	0.000	6.748
30	29.156	29.156	19.980	5.295	4.250	0.000	6.748
35	29.156	29.156	19.980	5.295	4.250	0.000	6.748
40	29.156	29.156	19.980	5.295	4.250	0.000	6.748
45	29.156	29.156	19.980	5.295	4.250	0.000	6.748
50	29.156	29.156	19.980	5.295	4.250	0.000	6.748
55	29.156	29.156	19.980	5.295	4.250	0.000	6.748
60	29.156	29.156	19.980	5.295	4.250	0.000	6.748
65	29.156	29.156	19.980	5.295	4.250	0.000	6.748

```
Title    : Orange County 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count          County Average

                            Table   2:  Starting Emissions (grams/trip)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.007	0.011	0.034	0.061	0.248	0.653	0.017
10	0.013	0.022	0.066	0.118	0.483	0.804	0.031
20	0.025	0.042	0.129	0.224	0.915	1.094	0.057
30	0.037	0.061	0.187	0.317	1.297	1.368	0.081
40	0.047	0.079	0.241	0.398	1.629	1.626	0.104
50	0.056	0.095	0.292	0.467	1.911	1.869	0.124
60	0.065	0.109	0.338	0.523	2.142	2.045	0.142
120	0.097	0.166	0.525	0.588	2.408	2.310	0.202
180	0.094	0.162	0.523	0.624	2.555	2.339	0.201
240	0.100	0.172	0.556	0.659	2.698	2.487	0.213
300	0.106	0.182	0.588	0.693	2.835	2.631	0.225
360	0.111	0.192	0.620	0.725	2.968	2.773	0.237
420	0.117	0.202	0.652	0.757	3.097	2.912	0.249
480	0.122	0.211	0.683	0.787	3.221	3.047	0.260
540	0.128	0.221	0.714	0.816	3.340	3.180	0.271
600	0.133	0.230	0.745	0.844	3.454	3.310	0.283
660	0.138	0.239	0.775	0.871	3.564	3.436	0.293
720	0.143	0.248	0.805	0.896	3.669	3.560	0.304

```
     Pollutant Name: Carbon Monoxide           Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.095	0.159	0.395	0.957	3.030	2.982	0.205
10	0.187	0.313	0.780	1.874	5.936	3.584	0.394
20	0.364	0.609	1.519	3.593	11.380	4.738	0.755
30	0.531	0.887	2.219	5.157	16.332	5.825	1.092
40	0.688	1.148	2.879	6.565	20.791	6.845	1.406
50	0.834	1.391	3.499	7.817	24.758	7.798	1.696
60	0.970	1.618	4.079	8.915	28.232	8.684	1.963
120	1.500	2.478	6.316	10.411	32.970	12.298	2.850
180	1.409	2.338	6.046	10.715	33.934	11.932	2.743
240	1.519	2.518	6.541	11.029	34.930	12.950	2.932
300	1.616	2.677	6.980	11.354	35.957	13.891	3.102
360	1.701	2.818	7.362	11.688	37.016	14.753	3.254
420	1.775	2.938	7.687	12.033	38.107	15.538	3.388
480	1.836	3.040	7.956	12.387	39.230	16.244	3.503
540	1.886	3.122	8.168	12.752	40.384	16.873	3.599
600	1.923	3.184	8.324	13.126	41.570	17.424	3.677
660	1.948	3.227	8.423	13.511	42.788	17.897	3.736
720	1.962	3.250	8.466	13.905	44.038	18.292	3.778

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.041	0.087	0.509	0.236	1.216	0.154	0.120
10	0.045	0.095	0.545	0.356	1.832	0.193	0.135
20	0.052	0.108	0.610	0.566	2.914	0.262	0.162
30	0.058	0.119	0.665	0.738	3.795	0.319	0.184
40	0.062	0.129	0.710	0.870	4.476	0.364	0.202
50	0.066	0.136	0.745	0.964	4.957	0.397	0.215
60	0.069	0.141	0.771	1.018	5.238	0.418	0.224
120	0.073	0.151	0.833	1.026	5.276	0.420	0.237
180	0.074	0.151	0.833	1.022	5.257	0.416	0.237
240	0.073	0.150	0.827	1.016	5.227	0.410	0.235
300	0.072	0.149	0.817	1.009	5.187	0.402	0.233
360	0.071	0.146	0.803	0.999	5.137	0.392	0.229
420	0.070	0.143	0.785	0.987	5.077	0.380	0.225
480	0.068	0.139	0.764	0.973	5.006	0.367	0.219
540	0.066	0.135	0.739	0.958	4.925	0.352	0.213
600	0.063	0.130	0.710	0.940	4.834	0.335	0.206
660	0.061	0.124	0.677	0.920	4.733	0.317	0.198
720	0.058	0.118	0.640	0.899	4.621	0.297	0.189

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	12.197	15.285	21.147	2.791	4.716	13.302	13.637
10	13.702	17.210	24.090	5.566	9.406	15.500	15.496
20	17.210	21.682	30.820	11.070	18.707	19.817	19.759
30	21.384	26.984	38.674	16.512	27.904	24.025	24.747
40	26.223	33.117	47.653	21.892	36.997	28.127	30.460
50	31.728	40.080	57.755	27.211	45.985	32.121	36.898
60	37.898	47.874	68.982	32.468	54.868	36.007	44.061
120	88.235	111.137	157.804	55.222	93.322	53.465	100.997
180	100.164	126.203	179.490	65.241	110.253	57.696	114.823
240	112.072	141.234	201.058	74.669	126.184	61.679	128.583
300	123.959	156.228	222.509	83.505	141.117	65.414	142.275
360	135.825	171.187	243.843	91.749	155.050	68.900	155.901
420	147.670	186.109	265.060	99.403	167.983	72.138	169.460
480	159.493	200.996	286.159	106.465	179.918	75.127	182.953
540	171.295	215.848	307.141	112.936	190.853	77.868	196.379
600	183.077	230.663	328.006	118.815	200.789	80.361	209.738
660	194.837	245.442	348.753	124.103	209.725	82.606	223.030
720	206.576	260.186	369.383	128.800	217.662	84.602	236.255

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.001	0.000	0.000
40	0.000	0.000	0.001	0.000	0.001	0.000	0.000
50	0.000	0.000	0.001	0.000	0.001	0.001	0.000
60	0.000	0.000	0.001	0.000	0.001	0.001	0.000
120	0.001	0.001	0.002	0.001	0.002	0.001	0.001
180	0.001	0.001	0.002	0.001	0.002	0.001	0.001
240	0.001	0.001	0.002	0.001	0.002	0.001	0.001
300	0.001	0.002	0.002	0.001	0.002	0.001	0.001
360	0.001	0.002	0.002	0.001	0.002	0.001	0.002
420	0.001	0.002	0.003	0.001	0.002	0.001	0.002
480	0.002	0.002	0.003	0.001	0.003	0.001	0.002
540	0.002	0.002	0.003	0.001	0.003	0.001	0.002
600	0.002	0.002	0.003	0.001	0.003	0.001	0.002
660	0.002	0.002	0.004	0.001	0.003	0.001	0.002
720	0.002	0.003	0.004	0.002	0.003	0.001	0.002

Pollutant Name: PM10 Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.001	0.001	0.000	0.001	0.007	0.001
10	0.001	0.002	0.002	0.001	0.002	0.006	0.001
20	0.002	0.003	0.004	0.001	0.003	0.005	0.003
30	0.003	0.005	0.006	0.002	0.004	0.004	0.004
40	0.004	0.007	0.007	0.003	0.005	0.003	0.005
50	0.004	0.008	0.009	0.003	0.006	0.003	0.006
60	0.005	0.010	0.011	0.004	0.007	0.003	0.007
120	0.008	0.016	0.017	0.005	0.010	0.006	0.011
180	0.009	0.017	0.019	0.005	0.010	0.008	0.013
240	0.010	0.019	0.021	0.005	0.010	0.011	0.014
300	0.011	0.020	0.022	0.005	0.011	0.013	0.015
360	0.012	0.022	0.024	0.005	0.011	0.014	0.016
420	0.012	0.023	0.025	0.006	0.011	0.016	0.016
480	0.013	0.023	0.026	0.006	0.012	0.017	0.017
540	0.013	0.024	0.026	0.006	0.012	0.018	0.017
600	0.013	0.025	0.027	0.006	0.012	0.019	0.018
660	0.013	0.025	0.027	0.006	0.013	0.019	0.018
720	0.013	0.025	0.027	0.007	0.013	0.019	0.018

Title : Orange County 2030
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season : Annual
Area : Orange County
****
Year:2030 -- Model Years 1985 to 2030 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Apr 23 2003

County Average Orange Count County Average

Table 4: Hot Soak Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.010	0.017	0.015	0.003	0.031	0.057	0.012
10	0.019	0.033	0.029	0.005	0.059	0.110	0.024
20	0.035	0.061	0.055	0.009	0.106	0.206	0.044
30	0.049	0.086	0.079	0.014	0.143	0.293	0.062
40	0.055	0.097	0.090	0.016	0.160	0.333	0.070

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

```
Title    : Orange County 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                             Table  5a:  Partial Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.000    0.000    0.000    0.000    0.000    0.071    0.001


Title    : Orange County 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                             Table  5b:  Multi-Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.000    0.000    0.000    0.000    0.000    0.007    0.000


Title    : Orange County 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                             Table  6a:  Partial Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.013    0.034    0.042    0.001    0.002    0.075    0.022
```

```
Title    : Orange County 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                            Table  6b:  Multi-Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.001    0.003    0.003    0.000    0.000    0.007    0.002
```

```
Title    : Orange County 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                Orange Count         County Average

                            Table   7:  Estimated Travel Fractions

     Pollutant Name:                           Temperature: ALL   Relative Humidity: ALL


                LDA      LDT      MDT      HDT      UBUS     MCY      ALL

    %VMT       0.578    0.287    0.085    0.044    0.003    0.003    1.000
    %TRIP      0.550    0.276    0.118    0.050    0.001    0.004    1.000
    %VEH       0.578    0.295    0.085    0.028    0.001    0.013    1.000
```

```
Title    : Orange County 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:43:48
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Orange County
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                              Orange Count          County Average

                        Table   8:  Evaporative Running Loss Emissions (grams/minute)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.008	0.258	0.369	0.184	1.060	0.004	0.121
2	0.006	0.131	0.187	0.093	0.537	0.036	0.063
3	0.007	0.091	0.129	0.063	0.365	0.053	0.045
4	0.008	0.072	0.101	0.048	0.279	0.063	0.037
5	0.009	0.061	0.085	0.039	0.228	0.069	0.033
10	0.011	0.040	0.053	0.022	0.128	0.081	0.024
15	0.012	0.033	0.043	0.017	0.096	0.084	0.021
20	0.012	0.030	0.039	0.014	0.082	0.085	0.020
25	0.012	0.029	0.036	0.012	0.074	0.084	0.019
30	0.012	0.029	0.035	0.012	0.073	0.083	0.019
35	0.011	0.028	0.035	0.011	0.072	0.082	0.019
40	0.011	0.028	0.034	0.011	0.072	0.081	0.018
45	0.011	0.027	0.033	0.010	0.071	0.080	0.018
50	0.011	0.027	0.033	0.010	0.070	0.078	0.018
55	0.011	0.027	0.032	0.010	0.070	0.077	0.018
60	0.011	0.026	0.032	0.009	0.069	0.076	0.017

Riverside County EMFAC2002 Output File

```
Title    : Riverside County Subarea 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                     Riverside (SC)                Riverside (SC)

                              Table   1:  Running Exhaust Emissions (grams/mile)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.670	0.857	1.143	3.159	10.074	5.140	0.947
10	0.441	0.577	0.772	2.251	6.674	4.030	0.641
15	0.306	0.408	0.546	1.668	4.607	3.307	0.456
20	0.223	0.303	0.404	1.281	3.315	2.843	0.340
25	0.171	0.236	0.313	1.019	2.484	2.560	0.266
30	0.138	0.193	0.253	0.838	1.940	2.417	0.218
35	0.118	0.166	0.215	0.711	1.578	2.393	0.187
40	0.105	0.149	0.191	0.622	1.338	2.483	0.168
45	0.099	0.141	0.178	0.560	1.182	2.701	0.158
50	0.098	0.141	0.174	0.519	1.089	3.079	0.156
55	0.102	0.147	0.178	0.496	1.045	3.677	0.162
60	0.113	0.162	0.191	0.487	1.045	4.596	0.176
65	0.131	0.187	0.216	0.493	1.090	6.011	0.202

```
     Pollutant Name: Carbon Monoxide           Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	7.252	10.625	11.406	33.595	86.853	38.277	10.489
10	6.223	8.867	9.039	22.561	57.515	31.440	8.469
15	5.448	7.600	7.456	15.971	40.266	27.179	7.090
20	4.847	6.660	6.357	11.915	29.801	24.727	6.115
25	4.372	5.951	5.576	9.368	23.314	23.673	5.406
30	3.994	5.413	5.016	7.762	19.279	23.853	4.884
35	3.693	5.008	4.619	6.777	16.851	25.297	4.504
40	3.456	4.716	4.354	6.235	15.568	28.246	4.240
45	3.279	4.526	4.209	6.047	15.201	33.211	4.080
50	3.161	4.442	4.184	6.182	15.688	41.128	4.028
55	3.106	4.478	4.297	6.664	17.111	53.650	4.100
60	3.129	4.666	4.590	7.577	19.724	73.726	4.335
65	3.257	5.068	5.141	9.088	24.030	106.730	4.805

```
     Pollutant Name: Oxides of Nitrogen        Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.597	0.978	1.971	17.271	19.412	0.954	1.794
10	0.516	0.839	1.684	14.486	15.563	0.994	1.521
15	0.457	0.739	1.482	12.593	13.155	1.035	1.331
20	0.414	0.667	1.343	11.338	11.674	1.077	1.201
25	0.382	0.616	1.250	10.563	10.821	1.121	1.115
30	0.360	0.581	1.193	10.174	10.434	1.166	1.066
35	0.346	0.560	1.168	10.124	10.431	1.212	1.047
40	0.338	0.551	1.171	10.405	10.791	1.259	1.056
45	0.337	0.553	1.203	11.042	11.550	1.307	1.096
50	0.342	0.566	1.266	12.104	12.811	1.355	1.169
55	0.354	0.592	1.368	13.712	14.768	1.403	1.285
60	0.373	0.632	1.519	16.065	17.768	1.453	1.456
65	0.401	0.690	1.737	19.481	22.414	1.502	1.706

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	987.118	1192.332	1732.208	2089.658	2636.411	223.518	1176.728
10	744.736	900.787	1270.775	1921.331	2146.296	190.887	904.841
15	583.743	707.093	977.331	1821.928	1856.866	165.725	725.982
20	475.194	576.476	786.317	1761.403	1680.636	146.260	606.295
25	401.661	487.983	660.484	1723.788	1571.112	131.219	525.687
30	352.473	428.780	578.128	1700.354	1502.879	119.682	472.002
35	321.079	390.988	526.461	1686.252	1461.820	110.992	437.853
40	303.569	369.903	498.105	1678.830	1440.209	104.682	418.860
45	297.846	363.005	489.229	1676.781	1434.242	100.444	412.695
50	303.206	369.446	498.638	1679.756	1442.904	98.096	418.586
55	320.193	389.885	527.513	1688.263	1467.675	97.577	437.165
60	350.714	426.622	579.686	1703.814	1512.955	98.951	470.597
65	398.419	484.055	662.578	1729.382	1587.400	102.432	523.044

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.010	0.012	0.020	0.137	0.113	0.003	0.019
10	0.007	0.009	0.016	0.135	0.107	0.003	0.016
15	0.006	0.007	0.013	0.134	0.104	0.002	0.014
20	0.005	0.006	0.011	0.133	0.102	0.002	0.013
25	0.004	0.005	0.010	0.133	0.101	0.002	0.012
30	0.004	0.005	0.009	0.132	0.101	0.002	0.012
35	0.003	0.004	0.009	0.132	0.100	0.002	0.011
40	0.003	0.004	0.008	0.132	0.100	0.002	0.011
45	0.003	0.004	0.008	0.132	0.100	0.002	0.011
50	0.003	0.004	0.008	0.132	0.100	0.002	0.011
55	0.003	0.004	0.009	0.132	0.100	0.002	0.011
60	0.003	0.005	0.009	0.133	0.101	0.002	0.012
65	0.004	0.005	0.010	0.133	0.101	0.003	0.012

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.056	0.083	0.103	0.746	0.493	0.066	0.108
10	0.037	0.055	0.071	0.585	0.354	0.052	0.077
15	0.026	0.039	0.051	0.468	0.264	0.043	0.057
20	0.019	0.029	0.038	0.384	0.204	0.037	0.044
25	0.015	0.022	0.030	0.322	0.163	0.034	0.036
30	0.012	0.018	0.025	0.275	0.135	0.032	0.030
35	0.010	0.015	0.021	0.241	0.116	0.032	0.026
40	0.009	0.014	0.019	0.216	0.104	0.033	0.023
45	0.008	0.013	0.017	0.198	0.096	0.036	0.021
50	0.008	0.013	0.017	0.185	0.092	0.041	0.020
55	0.008	0.013	0.017	0.177	0.091	0.048	0.020
60	0.009	0.014	0.018	0.173	0.094	0.060	0.021
65	0.011	0.016	0.020	0.173	0.100	0.078	0.023

Pollutant Name: PM10 - Tire Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.008	0.008	0.009	0.026	0.010	0.004	0.009
10	0.008	0.008	0.009	0.026	0.010	0.004	0.009
15	0.008	0.008	0.009	0.026	0.010	0.004	0.009
20	0.008	0.008	0.009	0.026	0.010	0.004	0.009
25	0.008	0.008	0.009	0.026	0.010	0.004	0.009
30	0.008	0.008	0.009	0.026	0.010	0.004	0.009
35	0.008	0.008	0.009	0.026	0.010	0.004	0.009
40	0.008	0.008	0.009	0.026	0.010	0.004	0.009
45	0.008	0.008	0.009	0.026	0.010	0.004	0.009
50	0.008	0.008	0.009	0.026	0.010	0.004	0.009
55	0.008	0.008	0.009	0.026	0.010	0.004	0.009
60	0.008	0.008	0.009	0.026	0.010	0.004	0.009
65	0.008	0.008	0.009	0.026	0.010	0.004	0.009

Pollutant Name: PM10 - Break Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.013	0.013	0.013	0.013	0.013	0.013	0.013
10	0.013	0.013	0.013	0.013	0.013	0.013	0.013
15	0.013	0.013	0.013	0.013	0.013	0.013	0.013
20	0.013	0.013	0.013	0.013	0.013	0.013	0.013
25	0.013	0.013	0.013	0.013	0.013	0.013	0.013
30	0.013	0.013	0.013	0.013	0.013	0.013	0.013
35	0.013	0.013	0.013	0.013	0.013	0.013	0.013
40	0.013	0.013	0.013	0.013	0.013	0.013	0.013
45	0.013	0.013	0.013	0.013	0.013	0.013	0.013
50	0.013	0.013	0.013	0.013	0.013	0.013	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013	0.013
60	0.013	0.013	0.013	0.013	0.013	0.013	0.013
65	0.013	0.013	0.013	0.013	0.013	0.013	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	8.837	7.218	4.830	3.234	3.162	28.005	7.961
10	11.703	9.559	6.543	4.863	4.754	33.304	10.545
15	14.918	12.184	8.525	6.921	6.770	38.581	13.449
20	18.312	14.957	10.675	9.325	9.127	43.555	16.520
25	21.654	17.687	12.842	11.894	11.651	47.903	19.547
30	24.672	20.152	14.834	14.361	14.080	51.272	22.283
35	27.089	22.126	16.446	16.414	16.109	53.303	24.473
40	28.666	23.413	17.495	17.758	17.446	53.666	25.898
45	29.241	23.879	17.854	18.184	17.885	52.121	26.407
50	28.753	23.477	17.482	17.624	17.353	48.582	25.945
55	27.260	22.252	16.426	16.167	15.935	43.194	24.565
60	24.917	20.332	14.816	14.035	13.849	36.390	22.414
65	21.957	17.910	12.836	11.532	11.390	28.860	19.709

Pollutant Name: Diesel - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	27.659	28.985	21.192	5.217	3.590	0.000	9.921
10	27.659	28.985	21.192	5.217	3.590	0.000	9.921
15	27.659	28.985	21.192	5.217	3.590	0.000	9.921
20	27.659	28.985	21.192	5.217	3.590	0.000	9.921
25	27.659	28.985	21.192	5.217	3.590	0.000	9.921
30	27.659	28.985	21.192	5.217	3.590	0.000	9.921
35	27.659	28.985	21.192	5.217	3.590	0.000	9.921
40	27.659	28.985	21.192	5.217	3.590	0.000	9.921
45	27.659	28.985	21.192	5.217	3.590	0.000	9.921
50	27.659	28.985	21.192	5.217	3.590	0.000	9.921
55	27.659	28.985	21.192	5.217	3.590	0.000	9.921
60	27.659	28.985	21.192	5.217	3.590	0.000	9.921
65	27.659	28.985	21.192	5.217	3.590	0.000	9.921

Title : Riverside County Subarea 2005
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season : Annual
Area : Riverside (SC)
****
Year:2005 -- Model Years 1965 to 2005 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Apr 23 2003

Riverside (SC) Riverside (SC) Riverside (SC)

Table 2: Starting Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.140	0.147	0.288	0.974	1.008	1.428	0.220
10	0.226	0.234	0.444	1.266	1.375	1.461	0.327
20	0.387	0.398	0.737	1.819	2.066	1.559	0.529
30	0.532	0.547	1.001	2.333	2.699	1.695	0.713
40	0.662	0.680	1.238	2.806	3.274	1.871	0.878
50	0.776	0.797	1.447	3.239	3.791	2.086	1.025
60	0.869	0.894	1.616	3.565	4.188	2.198	1.143
120	1.069	1.091	1.869	3.824	4.517	2.180	1.351
180	1.060	1.092	1.936	4.081	4.815	2.353	1.372
240	1.122	1.157	2.050	4.332	5.105	2.533	1.454
300	1.183	1.220	2.161	4.577	5.388	2.713	1.533
360	1.242	1.281	2.270	4.817	5.664	2.891	1.611
420	1.299	1.341	2.375	5.050	5.933	3.069	1.687
480	1.355	1.399	2.477	5.278	6.194	3.246	1.760
540	1.410	1.456	2.577	5.500	6.448	3.423	1.832
600	1.463	1.511	2.674	5.716	6.695	3.598	1.902
660	1.514	1.565	2.767	5.927	6.935	3.773	1.970
720	1.564	1.617	2.858	6.132	7.167	3.947	2.036

Pollutant Name: Carbon Monoxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	1.231	1.451	2.727	11.775	10.028	5.817	2.170
10	2.028	2.403	4.264	15.174	14.736	5.467	3.263
20	3.535	4.201	7.164	21.633	23.612	4.882	5.331
30	4.925	5.859	9.831	27.639	31.766	4.447	7.240
40	6.199	7.377	12.266	33.190	39.198	4.163	8.992
50	7.355	8.756	14.469	38.288	45.908	4.030	10.586
60	8.395	9.994	16.440	42.932	51.897	4.048	12.023
120	11.513	13.386	20.505	51.881	61.212	6.708	15.707
180	10.853	12.839	20.705	56.123	64.697	8.843	15.511
240	11.440	13.528	21.777	60.107	68.049	10.858	16.410
300	11.992	14.176	22.798	63.831	71.267	12.646	17.256
360	12.508	14.783	23.767	67.297	74.353	14.209	18.047
420	12.989	15.349	24.684	70.503	77.305	15.547	18.784
480	13.435	15.874	25.550	73.451	80.124	16.658	19.467
540	13.846	16.359	26.364	76.139	82.809	17.544	20.096
600	14.221	16.802	27.127	78.569	85.362	18.204	20.670
660	14.561	17.205	27.838	80.739	87.781	18.639	21.191
720	14.866	17.567	28.497	82.651	90.067	18.848	21.657

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.272	0.373	0.694	1.162	1.567	0.230	0.411
10	0.335	0.450	0.920	1.709	2.334	0.254	0.528
20	0.446	0.587	1.317	2.669	3.681	0.298	0.734
30	0.537	0.700	1.642	3.452	4.779	0.335	0.904
40	0.608	0.789	1.894	4.059	5.628	0.366	1.036
50	0.660	0.853	2.075	4.488	6.229	0.391	1.130
60	0.692	0.894	2.183	4.741	6.580	0.409	1.188
120	0.713	0.925	2.228	4.776	6.629	0.413	1.216
180	0.715	0.928	2.224	4.755	6.602	0.404	1.216
240	0.710	0.921	2.210	4.723	6.562	0.392	1.207
300	0.702	0.911	2.190	4.682	6.508	0.377	1.196
360	0.693	0.898	2.164	4.630	6.441	0.359	1.180
420	0.681	0.883	2.133	4.568	6.361	0.339	1.162
480	0.667	0.864	2.096	4.496	6.267	0.315	1.140
540	0.650	0.842	2.053	4.413	6.159	0.288	1.114
600	0.632	0.817	2.005	4.321	6.038	0.258	1.085
660	0.611	0.789	1.951	4.218	5.903	0.226	1.053
720	0.588	0.759	1.891	4.104	5.755	0.190	1.017

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	10.324	12.642	15.762	15.181	15.776	28.641	12.134
10	13.407	16.170	22.400	19.591	21.626	31.348	15.863
20	19.797	23.523	35.827	28.293	33.190	36.615	23.535
30	26.485	31.269	49.455	36.841	44.572	41.685	31.493
40	33.472	39.408	63.285	45.234	55.771	46.558	39.738
50	40.756	47.941	77.315	53.473	66.787	51.234	48.270
60	48.339	56.868	91.547	61.556	77.621	55.713	57.088
120	93.916	111.879	165.767	97.160	125.083	76.583	108.350
180	108.030	128.512	191.986	109.488	142.898	77.698	124.525
240	121.678	144.633	217.016	121.090	159.663	78.750	140.119
300	134.859	160.243	240.859	131.966	175.378	79.740	155.133
360	147.574	175.343	263.513	142.115	190.042	80.667	169.567
420	159.821	189.930	284.979	151.538	203.656	81.532	183.421
480	171.602	204.007	305.257	160.235	216.220	82.334	196.695
540	182.916	217.573	324.347	168.206	227.734	83.073	209.389
600	193.764	230.628	342.249	175.450	238.197	83.750	221.502
660	204.144	243.171	358.963	181.968	247.610	84.365	233.036
720	214.058	255.203	374.488	187.760	255.973	84.917	243.989

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.001	0.000	0.000
20	0.000	0.000	0.000	0.001	0.001	0.001	0.000
30	0.000	0.000	0.001	0.001	0.001	0.001	0.000
40	0.000	0.001	0.001	0.001	0.001	0.001	0.001
50	0.001	0.001	0.001	0.001	0.002	0.001	0.001
60	0.001	0.001	0.001	0.001	0.002	0.001	0.001
120	0.001	0.001	0.002	0.002	0.002	0.001	0.001
180	0.001	0.001	0.002	0.002	0.003	0.001	0.002
240	0.001	0.002	0.003	0.002	0.003	0.001	0.002
300	0.002	0.002	0.003	0.003	0.003	0.001	0.002
360	0.002	0.002	0.003	0.003	0.003	0.001	0.002
420	0.002	0.002	0.003	0.003	0.003	0.001	0.002
480	0.002	0.002	0.003	0.003	0.004	0.001	0.002
540	0.002	0.002	0.004	0.003	0.004	0.001	0.002
600	0.002	0.003	0.004	0.003	0.004	0.001	0.003
660	0.002	0.003	0.004	0.003	0.004	0.001	0.003
720	0.002	0.003	0.004	0.003	0.004	0.001	0.003

Pollutant Name: PM10 Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.001	0.001	0.001	0.001	0.002	0.017	0.001
10	0.002	0.002	0.003	0.002	0.002	0.015	0.002
20	0.003	0.004	0.005	0.002	0.003	0.011	0.004
30	0.005	0.006	0.006	0.003	0.005	0.009	0.005
40	0.006	0.008	0.008	0.004	0.006	0.007	0.007
50	0.007	0.009	0.010	0.004	0.007	0.005	0.008
60	0.008	0.011	0.011	0.005	0.008	0.004	0.009
120	0.011	0.016	0.015	0.007	0.011	0.011	0.013
180	0.012	0.016	0.016	0.007	0.011	0.017	0.014
240	0.012	0.017	0.017	0.008	0.012	0.023	0.014
300	0.013	0.018	0.017	0.008	0.012	0.027	0.015
360	0.013	0.019	0.018	0.009	0.013	0.032	0.015
420	0.014	0.019	0.019	0.009	0.013	0.035	0.016
480	0.014	0.020	0.019	0.009	0.014	0.038	0.017
540	0.015	0.021	0.020	0.010	0.014	0.040	0.017
600	0.015	0.021	0.020	0.010	0.015	0.042	0.018
660	0.015	0.022	0.021	0.010	0.015	0.043	0.018
720	0.016	0.022	0.021	0.010	0.015	0.043	0.018

```
Title    : Riverside County Subarea 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                      Riverside (SC)                Riverside (SC)

                             Table   4:  Hot Soak Emissions (grams/trip)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL

     Time
      min       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       5      0.040    0.041    0.035    0.029    0.122    0.169    0.040
      10      0.076    0.078    0.068    0.056    0.229    0.317    0.076
      20      0.141    0.145    0.128    0.103    0.402    0.559    0.141
      30      0.197    0.203    0.181    0.143    0.533    0.746    0.197
      40      0.223    0.229    0.206    0.161    0.587    0.823    0.223

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes
(about 25% of in-use trips).
```

```
Title    : Riverside County Subarea 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                      Riverside (SC)                Riverside (SC)

                             Table  5a:  Partial Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70     0.018    0.017    0.014    0.000    0.000    0.086    0.018
```

```
Title    : Riverside County Subarea 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                      Riverside (SC)                Riverside (SC)

                             Table  5b:  Multi-Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70     0.002    0.002    0.001    0.000    0.000    0.008    0.002
```

```
Title    : Riverside County Subarea 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table  6a:  Partial Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.055    0.058    0.050    0.006    0.004    0.109    0.055


Title    : Riverside County Subarea 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table  6b:  Multi-Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.005    0.005    0.004    0.000    0.001    0.008    0.004


Title    : Riverside County Subarea 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table   7:  Estimated Travel Fractions

     Pollutant Name:                           Temperature: ALL   Relative Humidity: ALL


                LDA      LDT      MDT      HDT      UBUS     MCY      ALL

    %VMT       0.515    0.347    0.077    0.055    0.002    0.004    1.000
    %TRIP      0.486    0.328    0.117    0.063    0.000    0.006    1.000
    %VEH       0.519    0.350    0.071    0.039    0.001    0.019    1.000
```

```
Title    : Riverside County Subarea 2005
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)                 Riverside (SC)

                             Table   8:  Evaporative Running Loss Emissions (grams/minute)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.039	0.366	0.377	0.294	0.747	0.185	0.195
2	0.044	0.195	0.201	0.163	0.423	0.217	0.117
3	0.048	0.140	0.144	0.120	0.316	0.234	0.093
4	0.052	0.114	0.116	0.098	0.263	0.244	0.082
5	0.054	0.098	0.100	0.086	0.232	0.251	0.076
10	0.058	0.072	0.071	0.060	0.171	0.271	0.065
15	0.059	0.068	0.065	0.052	0.153	0.282	0.063
20	0.059	0.069	0.064	0.048	0.145	0.291	0.064
25	0.059	0.071	0.065	0.046	0.141	0.299	0.064
30	0.059	0.071	0.064	0.045	0.140	0.297	0.064
35	0.058	0.070	0.063	0.045	0.139	0.294	0.063
40	0.057	0.069	0.062	0.044	0.138	0.292	0.062
45	0.057	0.068	0.061	0.044	0.137	0.290	0.061
50	0.055	0.067	0.060	0.043	0.135	0.283	0.060
55	0.053	0.066	0.060	0.043	0.133	0.274	0.059
60	0.052	0.065	0.059	0.042	0.132	0.266	0.058

```
Title    : Riverside County Subarea 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)                 Riverside (SC)

                             Table   1:  Running Exhaust Emissions (grams/mile)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.342	0.511	0.708	1.857	8.490	4.905	0.562
10	0.222	0.340	0.477	1.345	5.625	3.780	0.380
15	0.151	0.238	0.337	1.010	3.885	3.056	0.270
20	0.109	0.175	0.249	0.786	2.796	2.594	0.202
25	0.083	0.135	0.193	0.632	2.096	2.312	0.158
30	0.067	0.110	0.157	0.524	1.638	2.164	0.130
35	0.057	0.094	0.133	0.447	1.333	2.128	0.112
40	0.051	0.085	0.118	0.393	1.131	2.197	0.101
45	0.048	0.080	0.110	0.356	0.999	2.382	0.095
50	0.047	0.080	0.107	0.330	0.921	2.711	0.094
55	0.049	0.083	0.110	0.316	0.884	3.236	0.098
60	0.054	0.091	0.118	0.310	0.884	4.049	0.107
65	0.063	0.106	0.134	0.312	0.922	5.308	0.124

Pollutant Name: Carbon Monoxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	4.405	6.929	7.341	18.601	69.919	30.877	6.653
10	3.847	5.868	5.945	12.528	46.284	25.656	5.441
15	3.412	5.086	4.988	8.887	32.393	22.335	4.604
20	3.064	4.494	4.308	6.640	23.967	20.352	4.002
25	2.780	4.037	3.812	5.223	18.745	19.408	3.558
30	2.547	3.681	3.445	4.327	15.498	19.379	3.224
35	2.355	3.405	3.175	3.774	13.544	20.286	2.975
40	2.197	3.196	2.984	3.467	12.511	22.302	2.796
45	2.071	3.049	2.865	3.354	12.215	25.796	2.679
50	1.976	2.964	2.817	3.417	12.604	31.448	2.627
55	1.913	2.949	2.850	3.670	13.747	40.458	2.650
60	1.888	3.020	2.986	4.153	15.846	54.968	2.770
65	1.912	3.212	3.270	4.956	19.306	78.884	3.033

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.344	0.624	1.338	10.992	16.316	1.022	1.214
10	0.299	0.537	1.144	9.202	13.117	1.025	1.028
15	0.265	0.474	1.008	7.984	11.120	1.035	0.899
20	0.240	0.428	0.914	7.175	9.893	1.052	0.810
25	0.222	0.395	0.851	6.673	9.191	1.075	0.752
30	0.208	0.372	0.813	6.420	8.876	1.102	0.718
35	0.199	0.358	0.796	6.384	8.881	1.134	0.705
40	0.194	0.351	0.798	6.559	9.188	1.170	0.712
45	0.193	0.351	0.820	6.964	9.828	1.209	0.740
50	0.195	0.358	0.864	7.641	10.886	1.253	0.791
55	0.200	0.373	0.933	8.668	12.523	1.301	0.871
60	0.210	0.396	1.037	10.172	15.029	1.354	0.991
65	0.224	0.431	1.188	12.359	18.907	1.412	1.166

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	973.181	1201.037	1735.634	2086.471	2592.966	243.828	1181.102
10	734.071	906.768	1273.627	1940.543	2113.751	205.956	911.383
15	575.267	711.287	979.411	1854.368	1830.757	177.947	733.955
20	468.204	579.477	787.672	1801.897	1658.447	157.226	615.229
25	395.684	490.182	661.241	1769.287	1551.359	142.069	535.273
30	347.176	430.446	578.430	1748.971	1484.643	131.335	482.027
35	316.218	392.317	526.449	1736.746	1444.497	124.299	448.162
40	298.954	371.048	497.907	1730.312	1423.366	120.563	429.337
45	293.315	364.093	488.960	1728.535	1417.532	120.016	423.241
50	298.604	370.596	498.409	1731.114	1426.002	122.839	429.108
55	315.358	391.222	527.429	1738.489	1450.221	129.559	447.567
60	345.455	428.286	579.846	1751.971	1494.495	141.180	480.767
65	392.491	486.225	663.069	1774.136	1567.284	159.411	532.836

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.009	0.012	0.017	0.020	0.026	0.003	0.011
10	0.007	0.009	0.012	0.019	0.021	0.003	0.009
15	0.006	0.007	0.009	0.018	0.018	0.002	0.007
20	0.005	0.006	0.008	0.017	0.016	0.002	0.006
25	0.004	0.005	0.006	0.017	0.015	0.002	0.005
30	0.003	0.004	0.006	0.017	0.014	0.002	0.005
35	0.003	0.004	0.005	0.017	0.014	0.002	0.004
40	0.003	0.004	0.005	0.017	0.014	0.002	0.004
45	0.003	0.004	0.005	0.017	0.014	0.002	0.004
50	0.003	0.004	0.005	0.017	0.014	0.002	0.004
55	0.003	0.004	0.005	0.017	0.014	0.002	0.004
60	0.003	0.004	0.006	0.017	0.015	0.002	0.005
65	0.004	0.005	0.006	0.017	0.015	0.003	0.005

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.060	0.095	0.114	0.495	0.413	0.051	0.104
10	0.039	0.063	0.076	0.388	0.296	0.040	0.072
15	0.027	0.044	0.054	0.311	0.220	0.033	0.053
20	0.020	0.032	0.040	0.254	0.170	0.029	0.040
25	0.015	0.024	0.031	0.213	0.136	0.026	0.032
30	0.012	0.020	0.025	0.183	0.112	0.025	0.027
35	0.010	0.017	0.022	0.160	0.097	0.024	0.023
40	0.009	0.015	0.019	0.143	0.086	0.025	0.020
45	0.009	0.014	0.018	0.131	0.079	0.027	0.019
50	0.008	0.014	0.017	0.123	0.076	0.031	0.018
55	0.009	0.014	0.018	0.117	0.075	0.037	0.018
60	0.010	0.016	0.019	0.115	0.077	0.046	0.019
65	0.011	0.018	0.021	0.115	0.082	0.060	0.021

Pollutant Name: PM10 - Tire Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.008	0.008	0.009	0.027	0.010	0.004	0.009
10	0.008	0.008	0.009	0.027	0.010	0.004	0.009
15	0.008	0.008	0.009	0.027	0.010	0.004	0.009
20	0.008	0.008	0.009	0.027	0.010	0.004	0.009
25	0.008	0.008	0.009	0.027	0.010	0.004	0.009
30	0.008	0.008	0.009	0.027	0.010	0.004	0.009
35	0.008	0.008	0.009	0.027	0.010	0.004	0.009
40	0.008	0.008	0.009	0.027	0.010	0.004	0.009
45	0.008	0.008	0.009	0.027	0.010	0.004	0.009
50	0.008	0.008	0.009	0.027	0.010	0.004	0.009
55	0.008	0.008	0.009	0.027	0.010	0.004	0.009
60	0.008	0.008	0.009	0.027	0.010	0.004	0.009
65	0.008	0.008	0.009	0.027	0.010	0.004	0.009

Pollutant Name: PM10 - Break Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.013	0.013	0.013	0.013	0.013	0.013	0.013
10	0.013	0.013	0.013	0.013	0.013	0.013	0.013
15	0.013	0.013	0.013	0.013	0.013	0.013	0.013
20	0.013	0.013	0.013	0.013	0.013	0.013	0.013
25	0.013	0.013	0.013	0.013	0.013	0.013	0.013
30	0.013	0.013	0.013	0.013	0.013	0.013	0.013
35	0.013	0.013	0.013	0.013	0.013	0.013	0.013
40	0.013	0.013	0.013	0.013	0.013	0.013	0.013
45	0.013	0.013	0.013	0.013	0.013	0.013	0.013
50	0.013	0.013	0.013	0.013	0.013	0.013	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013	0.013
60	0.013	0.013	0.013	0.013	0.013	0.013	0.013
65	0.013	0.013	0.013	0.013	0.013	0.013	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	9.019	7.242	4.888	3.353	3.217	27.359	8.063
10	11.948	9.593	6.616	5.040	4.838	32.739	10.684
15	15.235	12.232	8.611	7.172	6.888	38.056	13.629
20	18.707	15.020	10.774	9.660	9.285	42.996	16.744
25	22.126	17.764	12.952	12.318	11.850	47.211	19.814
30	25.212	20.242	14.952	14.867	14.317	50.345	22.587
35	27.682	22.225	16.569	16.984	16.376	52.067	24.805
40	29.290	23.516	17.620	18.366	17.731	52.107	26.244
45	29.869	23.981	17.980	18.797	18.171	50.308	26.752
50	29.362	23.572	17.607	18.209	17.626	46.671	26.275
55	27.826	22.337	16.548	16.695	16.181	41.404	24.869
60	25.425	20.406	14.935	14.488	14.059	34.944	22.684
65	22.397	17.971	12.949	11.899	11.560	27.916	19.941

Pollutant Name: Diesel - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	27.959	29.030	20.842	5.180	3.736	0.000	8.376
10	27.959	29.030	20.842	5.180	3.736	0.000	8.376
15	27.959	29.030	20.842	5.180	3.736	0.000	8.376
20	27.959	29.030	20.842	5.180	3.736	0.000	8.376
25	27.959	29.030	20.842	5.180	3.736	0.000	8.376
30	27.959	29.030	20.842	5.180	3.736	0.000	8.376
35	27.959	29.030	20.842	5.180	3.736	0.000	8.376
40	27.959	29.030	20.842	5.180	3.736	0.000	8.376
45	27.959	29.030	20.842	5.180	3.736	0.000	8.376
50	27.959	29.030	20.842	5.180	3.736	0.000	8.376
55	27.959	29.030	20.842	5.180	3.736	0.000	8.376
60	27.959	29.030	20.842	5.180	3.736	0.000	8.376
65	27.959	29.030	20.842	5.180	3.736	0.000	8.376

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Title    : Riverside County Subarea 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table   2:  Starting Emissions (grams/trip)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.074	0.085	0.175	0.541	0.815	1.112	0.126
10	0.125	0.144	0.296	0.759	1.160	1.186	0.199
20	0.222	0.254	0.521	1.167	1.806	1.348	0.336
30	0.310	0.353	0.726	1.539	2.393	1.529	0.460
40	0.388	0.443	0.908	1.875	2.921	1.728	0.572
50	0.458	0.522	1.070	2.175	3.391	1.946	0.672
60	0.517	0.589	1.205	2.407	3.756	2.078	0.754
120	0.666	0.750	1.482	2.609	4.085	2.150	0.926
180	0.657	0.746	1.523	2.779	4.351	2.270	0.936
240	0.696	0.790	1.613	2.945	4.609	2.433	0.992
300	0.734	0.833	1.700	3.106	4.860	2.594	1.046
360	0.771	0.876	1.786	3.264	5.105	2.754	1.099
420	0.807	0.917	1.869	3.417	5.343	2.913	1.151
480	0.842	0.957	1.951	3.565	5.574	3.069	1.202
540	0.877	0.997	2.030	3.710	5.799	3.225	1.251
600	0.911	1.035	2.108	3.850	6.016	3.378	1.299
660	0.943	1.073	2.183	3.986	6.227	3.531	1.346
720	0.975	1.109	2.256	4.117	6.431	3.681	1.392

Pollutant Name: Carbon Monoxide   Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.710	0.910	1.615	6.815	8.198	4.756	1.296
10	1.243	1.591	2.732	9.624	12.494	4.740	2.090
20	2.255	2.881	4.844	14.927	20.581	4.763	3.593
30	3.193	4.076	6.793	19.811	27.995	4.859	4.985
40	4.059	5.176	8.581	24.278	34.737	5.029	6.264
50	4.852	6.180	10.207	28.327	40.807	5.273	7.431
60	5.572	7.088	11.670	31.958	46.204	5.590	8.486
120	7.923	9.802	15.184	37.942	54.421	8.472	11.332
180	7.446	9.337	15.073	40.339	57.244	9.754	11.096
240	7.900	9.882	15.902	42.626	59.980	11.395	11.748
300	8.317	10.387	16.677	44.804	62.628	12.865	12.355
360	8.699	10.850	17.399	46.873	65.190	14.163	12.917
420	9.043	11.273	18.067	48.832	67.664	15.290	13.434
480	9.352	11.655	18.682	50.682	70.050	16.245	13.906
540	9.624	11.997	19.243	52.422	72.350	17.028	14.332
600	9.860	12.298	19.751	54.053	74.562	17.640	14.713
660	10.060	12.558	20.206	55.575	76.687	18.081	15.049
720	10.224	12.777	20.607	56.987	78.725	18.350	15.339

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.228	0.323	0.834	0.847	1.528	0.205	0.373
10	0.264	0.372	1.011	1.258	2.282	0.233	0.454
20	0.329	0.460	1.323	1.978	3.607	0.285	0.599
30	0.383	0.533	1.579	2.566	4.687	0.329	0.717
40	0.426	0.591	1.781	3.021	5.522	0.364	0.810
50	0.457	0.634	1.927	3.342	6.112	0.392	0.878
60	0.477	0.661	2.018	3.530	6.457	0.411	0.920
120	0.499	0.693	2.093	3.556	6.504	0.414	0.952
180	0.501	0.696	2.091	3.542	6.479	0.407	0.952
240	0.497	0.691	2.077	3.520	6.440	0.397	0.946
300	0.492	0.683	2.057	3.490	6.388	0.384	0.936
360	0.484	0.673	2.030	3.454	6.324	0.369	0.924
420	0.475	0.660	1.996	3.410	6.246	0.351	0.908
480	0.465	0.645	1.956	3.358	6.155	0.331	0.890
540	0.452	0.627	1.909	3.300	6.051	0.308	0.868
600	0.438	0.607	1.856	3.234	5.934	0.283	0.844
660	0.422	0.585	1.797	3.160	5.804	0.255	0.816
720	0.404	0.559	1.730	3.080	5.660	0.224	0.786

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	10.953	13.408	17.068	9.078	12.860	23.798	12.478
10	13.293	16.281	22.320	12.754	18.500	26.368	15.438
20	18.325	22.455	33.240	20.023	29.657	31.381	21.713
30	23.826	29.198	44.713	27.181	40.651	36.225	28.460
40	29.795	36.513	56.740	34.230	51.481	40.899	35.680
50	36.233	44.397	69.321	41.168	62.148	45.405	43.372
60	43.140	52.852	82.457	47.996	72.651	49.742	51.537
120	90.786	111.073	162.328	77.859	118.527	69.726	105.363
180	103.908	127.124	187.120	89.331	136.486	71.916	120.721
240	116.768	142.851	211.112	100.126	153.386	73.980	135.704
300	129.365	158.254	234.304	110.245	169.227	75.917	150.313
360	141.700	173.334	256.696	119.688	184.009	77.727	164.548
420	153.772	188.091	278.287	128.454	197.732	79.411	178.409
480	165.582	202.524	299.078	136.544	210.396	80.968	191.897
540	177.130	216.633	319.069	143.957	222.001	82.399	205.010
600	188.415	230.419	338.259	150.694	232.546	83.703	217.749
660	199.438	243.881	356.649	156.755	242.033	84.880	230.114
720	210.198	257.020	374.239	162.139	250.461	85.931	242.106

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.001	0.000	0.000
30	0.000	0.000	0.001	0.001	0.001	0.001	0.000
40	0.000	0.000	0.001	0.001	0.001	0.001	0.000
50	0.000	0.001	0.001	0.001	0.001	0.001	0.001
60	0.001	0.001	0.001	0.001	0.002	0.001	0.001
120	0.001	0.001	0.002	0.001	0.002	0.001	0.001
180	0.001	0.001	0.002	0.002	0.002	0.001	0.001
240	0.001	0.002	0.002	0.002	0.003	0.001	0.002
300	0.001	0.002	0.003	0.002	0.003	0.001	0.002
360	0.002	0.002	0.003	0.002	0.003	0.001	0.002
420	0.002	0.002	0.003	0.002	0.003	0.001	0.002
480	0.002	0.002	0.003	0.002	0.003	0.001	0.002
540	0.002	0.002	0.003	0.002	0.004	0.001	0.002
600	0.002	0.002	0.004	0.002	0.004	0.001	0.002
660	0.002	0.003	0.004	0.003	0.004	0.001	0.003

720	0.002	0.003	0.004	0.003	0.004	0.001	0.003

Pollutant Name: PM10 Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.001	0.001	0.001	0.001	0.001	0.013	0.001
10	0.002	0.002	0.003	0.001	0.002	0.012	0.002
20	0.003	0.005	0.005	0.002	0.003	0.009	0.004
30	0.004	0.007	0.007	0.003	0.005	0.007	0.005
40	0.005	0.009	0.009	0.003	0.006	0.006	0.007
50	0.007	0.010	0.011	0.004	0.007	0.004	0.008
60	0.008	0.012	0.012	0.004	0.008	0.004	0.009
120	0.011	0.018	0.018	0.006	0.011	0.009	0.014
180	0.012	0.019	0.019	0.006	0.011	0.014	0.015
240	0.013	0.020	0.020	0.007	0.012	0.018	0.016
300	0.014	0.021	0.021	0.007	0.012	0.022	0.017
360	0.014	0.022	0.022	0.007	0.013	0.026	0.017
420	0.015	0.023	0.022	0.008	0.013	0.028	0.018
480	0.015	0.024	0.023	0.008	0.014	0.031	0.019
540	0.016	0.025	0.024	0.008	0.014	0.033	0.019
600	0.016	0.025	0.024	0.008	0.015	0.034	0.020
660	0.016	0.026	0.025	0.009	0.015	0.035	0.020
720	0.017	0.026	0.026	0.009	0.015	0.035	0.020

Title : Riverside County Subarea 2010
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season : Annual
Area : Riverside (SC)
****
Year:2010 -- Model Years 1965 to 2010 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Apr 23 2003

Riverside (SC) Riverside (SC) Riverside (SC)

Table 4: Hot Soak Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.028	0.031	0.025	0.018	0.097	0.083	0.028
10	0.054	0.060	0.048	0.034	0.183	0.158	0.055
20	0.101	0.112	0.091	0.063	0.321	0.287	0.102
30	0.143	0.159	0.130	0.088	0.428	0.395	0.145
40	0.162	0.181	0.148	0.099	0.471	0.442	0.165

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

Title : Riverside County Subarea 2010
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season : Annual
Area : Riverside (SC)
****
Year:2010 -- Model Years 1965 to 2010 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Apr 23 2003

Riverside (SC) Riverside (SC) Riverside (SC)

Table 5a: Partial Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Reactive Org Gases Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL

70	0.001	0.001	0.001	0.000	0.000	0.089	0.003

```
Title    : Riverside County Subarea 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                      Riverside (SC)                Riverside (SC)

                             Table  5b:  Multi-Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL
```

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
70	0.000	0.000	0.000	0.000	0.000	0.008	0.000

```
Title    : Riverside County Subarea 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003


     Riverside (SC)                      Riverside (SC)                Riverside (SC)

                             Table  6a:  Partial Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL
```

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
70	0.043	0.049	0.043	0.004	0.003	0.078	0.044

```
Title    : Riverside County Subarea 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                      Riverside (SC)                Riverside (SC)

                             Table  6b:  Multi-Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL
```

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
70	0.003	0.004	0.003	0.000	0.001	0.007	0.004

```
Title    : Riverside County Subarea 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table   7:  Estimated Travel Fractions

     Pollutant Name:                         Temperature: ALL   Relative Humidity: ALL
```

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
%VMT	0.506	0.347	0.078	0.061	0.002	0.004	1.000
%TRIP	0.477	0.331	0.123	0.062	0.000	0.006	1.000
%VEH	0.509	0.355	0.075	0.041	0.001	0.020	1.000

```
Title    : Riverside County Subarea 2010
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2010 -- Model Years: 1965 to 2010
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2010 -- Model Years 1965 to 2010 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table   8:  Evaporative Running Loss Emissions (grams/minute)

     Pollutant Name: Reactive Org Gases       Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.025	0.423	0.439	0.327	0.907	0.053	0.216
2	0.026	0.218	0.227	0.172	0.487	0.090	0.119
3	0.029	0.152	0.158	0.121	0.348	0.109	0.089
4	0.031	0.121	0.125	0.096	0.280	0.119	0.075
5	0.033	0.102	0.105	0.081	0.239	0.127	0.066
10	0.036	0.068	0.068	0.051	0.159	0.142	0.051
15	0.037	0.059	0.058	0.041	0.134	0.148	0.047
20	0.037	0.057	0.055	0.036	0.122	0.152	0.046
25	0.037	0.057	0.054	0.033	0.116	0.155	0.046
30	0.037	0.056	0.052	0.033	0.115	0.153	0.045
35	0.036	0.055	0.051	0.032	0.114	0.151	0.044
40	0.036	0.054	0.051	0.031	0.113	0.150	0.044
45	0.035	0.054	0.050	0.031	0.112	0.148	0.043
50	0.034	0.053	0.049	0.030	0.111	0.145	0.042
55	0.033	0.052	0.048	0.030	0.110	0.141	0.042
60	0.032	0.052	0.048	0.030	0.109	0.138	0.041

```
Title    : Riverside County Subarea 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                         Table   1:  Running Exhaust Emissions (grams/mile)

     Pollutant Name: Reactive Org Gases       Temperature:  70F  Relative Humidity:  50%
```

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.050	0.093	0.147	0.499	2.187	4.678	0.118
10	0.031	0.058	0.094	0.385	1.460	3.510	0.080
15	0.021	0.040	0.066	0.304	1.015	2.771	0.058
20	0.015	0.028	0.048	0.247	0.736	2.303	0.044
25	0.011	0.021	0.037	0.206	0.556	2.015	0.036
30	0.009	0.017	0.030	0.175	0.437	1.857	0.030
35	0.008	0.014	0.025	0.153	0.358	1.804	0.026
40	0.007	0.013	0.022	0.136	0.306	1.846	0.024
45	0.006	0.012	0.021	0.125	0.272	1.988	0.023
50	0.006	0.012	0.020	0.116	0.252	2.255	0.023
55	0.007	0.012	0.020	0.111	0.243	2.689	0.025
60	0.007	0.013	0.022	0.109	0.244	3.371	0.028
65	0.008	0.015	0.024	0.109	0.255	4.438	0.033

Pollutant Name: Carbon Monoxide   Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.960	1.549	2.096	4.927	24.547	22.083	1.599
10	0.874	1.400	1.838	3.370	16.218	18.859	1.367
15	0.797	1.271	1.636	2.418	11.332	16.685	1.196
20	0.730	1.159	1.473	1.819	8.372	15.260	1.066
25	0.670	1.062	1.338	1.435	6.540	14.421	0.963
30	0.617	0.976	1.224	1.188	5.401	14.099	0.880
35	0.571	0.902	1.127	1.031	4.716	14.299	0.812
40	0.529	0.836	1.044	0.938	4.353	15.110	0.758
45	0.492	0.778	0.973	0.896	4.248	16.721	0.717
50	0.458	0.727	0.912	0.897	4.381	19.486	0.687
55	0.429	0.682	0.861	0.943	4.777	24.033	0.671
60	0.402	0.643	0.819	1.040	5.506	31.483	0.673
65	0.379	0.609	0.788	1.205	6.708	43.882	0.702

Pollutant Name: Oxides of Nitrogen   Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.069	0.135	0.269	1.674	6.180	1.121	0.212
10	0.060	0.117	0.231	1.401	5.126	1.071	0.181
15	0.053	0.103	0.203	1.214	4.480	1.037	0.159
20	0.048	0.092	0.184	1.091	4.096	1.017	0.143
25	0.044	0.084	0.170	1.014	3.889	1.009	0.133
30	0.041	0.079	0.161	0.975	3.815	1.011	0.126
35	0.039	0.075	0.156	0.969	3.849	1.021	0.123
40	0.038	0.072	0.155	0.996	3.985	1.041	0.123
45	0.037	0.071	0.157	1.057	4.235	1.069	0.127
50	0.037	0.072	0.164	1.160	4.627	1.106	0.134
55	0.037	0.073	0.174	1.317	5.215	1.153	0.146
60	0.039	0.077	0.191	1.547	6.099	1.211	0.163
65	0.041	0.082	0.215	1.880	7.448	1.282	0.190

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	962.685	1212.921	1719.215	2102.853	2427.701	266.250	1170.761
10	726.019	914.852	1269.566	1938.233	1968.895	221.954	900.356
15	568.853	716.880	980.405	1841.019	1697.954	190.645	722.200
20	462.902	583.407	790.419	1781.827	1532.982	168.681	602.841
25	391.138	492.995	664.316	1745.040	1430.455	153.747	522.384
30	343.139	432.517	581.286	1722.122	1366.580	144.416	468.771
35	312.509	393.920	528.950	1708.331	1328.144	139.891	434.659
40	295.429	372.394	500.100	1701.073	1307.914	139.878	415.697
45	289.853	365.361	490.961	1699.068	1302.328	144.546	409.563
50	295.090	371.952	500.332	1701.978	1310.437	154.583	415.489
55	311.670	392.838	529.323	1710.298	1333.625	171.335	434.100
60	341.448	430.358	581.610	1725.507	1376.013	197.101	467.549
65	387.983	489.000	664.298	1750.511	1445.702	235.654	519.963

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.009	0.012	0.017	0.020	0.024	0.003	0.011
10	0.007	0.009	0.012	0.019	0.019	0.003	0.009
15	0.005	0.007	0.009	0.018	0.016	0.002	0.007
20	0.004	0.006	0.008	0.017	0.015	0.002	0.006
25	0.004	0.005	0.006	0.017	0.014	0.002	0.005
30	0.003	0.004	0.006	0.016	0.013	0.002	0.005
35	0.003	0.004	0.005	0.016	0.013	0.002	0.004
40	0.003	0.004	0.005	0.016	0.013	0.002	0.004
45	0.003	0.004	0.005	0.016	0.013	0.002	0.004
50	0.003	0.004	0.005	0.016	0.013	0.002	0.004
55	0.003	0.004	0.005	0.016	0.013	0.002	0.004
60	0.003	0.004	0.006	0.016	0.013	0.003	0.004
65	0.004	0.005	0.006	0.017	0.014	0.003	0.005

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.063	0.104	0.129	0.193	0.214	0.030	0.090
10	0.041	0.067	0.084	0.151	0.152	0.024	0.060
15	0.028	0.046	0.058	0.121	0.112	0.019	0.042
20	0.020	0.033	0.042	0.099	0.086	0.017	0.031
25	0.015	0.025	0.032	0.083	0.068	0.015	0.024
30	0.012	0.020	0.026	0.071	0.056	0.014	0.019
35	0.010	0.017	0.022	0.062	0.048	0.014	0.016
40	0.009	0.015	0.019	0.055	0.042	0.014	0.015
45	0.009	0.014	0.018	0.051	0.039	0.016	0.014
50	0.009	0.014	0.018	0.047	0.037	0.018	0.013
55	0.009	0.015	0.018	0.045	0.037	0.021	0.014
60	0.010	0.016	0.020	0.044	0.038	0.026	0.015
65	0.011	0.019	0.023	0.044	0.040	0.034	0.017

Pollutant Name: PM10 - Tire Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.008	0.008	0.009	0.026	0.010	0.004	0.009
10	0.008	0.008	0.009	0.026	0.010	0.004	0.009
15	0.008	0.008	0.009	0.026	0.010	0.004	0.009
20	0.008	0.008	0.009	0.026	0.010	0.004	0.009
25	0.008	0.008	0.009	0.026	0.010	0.004	0.009
30	0.008	0.008	0.009	0.026	0.010	0.004	0.009
35	0.008	0.008	0.009	0.026	0.010	0.004	0.009
40	0.008	0.008	0.009	0.026	0.010	0.004	0.009
45	0.008	0.008	0.009	0.026	0.010	0.004	0.009
50	0.008	0.008	0.009	0.026	0.010	0.004	0.009
55	0.008	0.008	0.009	0.026	0.010	0.004	0.009
60	0.008	0.008	0.009	0.026	0.010	0.004	0.009
65	0.008	0.008	0.009	0.026	0.010	0.004	0.009

Pollutant Name: PM10 - Break Wear Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.013	0.013	0.013	0.013	0.013	0.013	0.013
10	0.013	0.013	0.013	0.013	0.013	0.013	0.013
15	0.013	0.013	0.013	0.013	0.013	0.013	0.013
20	0.013	0.013	0.013	0.013	0.013	0.013	0.013
25	0.013	0.013	0.013	0.013	0.013	0.013	0.013
30	0.013	0.013	0.013	0.013	0.013	0.013	0.013
35	0.013	0.013	0.013	0.013	0.013	0.013	0.013
40	0.013	0.013	0.013	0.013	0.013	0.013	0.013
45	0.013	0.013	0.013	0.013	0.013	0.013	0.013
50	0.013	0.013	0.013	0.013	0.013	0.013	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013	0.013
60	0.013	0.013	0.013	0.013	0.013	0.013	0.013
65	0.013	0.013	0.013	0.013	0.013	0.013	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	9.186	7.283	5.053	3.511	3.414	26.767	8.160
10	12.177	9.653	6.800	5.277	5.131	32.303	10.820
15	15.538	12.316	8.801	7.507	7.302	37.722	13.812
20	19.089	15.131	10.956	10.109	9.835	42.654	16.977
25	22.588	17.903	13.114	12.884	12.539	46.713	20.096
30	25.745	20.405	15.086	15.541	15.132	49.538	22.912
35	28.267	22.405	16.675	17.744	17.284	50.835	25.161
40	29.904	23.703	17.707	19.175	18.687	50.414	26.616
45	30.484	24.164	18.062	19.612	19.123	48.229	27.123
50	29.950	23.743	17.701	18.986	18.522	44.396	26.631
55	28.364	22.487	16.670	17.396	16.980	39.207	25.197
60	25.899	20.534	15.092	15.086	14.732	33.107	22.978
65	22.799	18.077	13.141	12.383	12.098	26.647	20.198

Pollutant Name: Diesel - mi/gal Temperature: 70F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	29.156	29.156	19.708	5.167	4.336	0.000	6.518
10	29.156	29.156	19.708	5.167	4.336	0.000	6.518
15	29.156	29.156	19.708	5.167	4.336	0.000	6.518
20	29.156	29.156	19.708	5.167	4.336	0.000	6.518
25	29.156	29.156	19.708	5.167	4.336	0.000	6.518
30	29.156	29.156	19.708	5.167	4.336	0.000	6.518
35	29.156	29.156	19.708	5.167	4.336	0.000	6.518
40	29.156	29.156	19.708	5.167	4.336	0.000	6.518
45	29.156	29.156	19.708	5.167	4.336	0.000	6.518
50	29.156	29.156	19.708	5.167	4.336	0.000	6.518
55	29.156	29.156	19.708	5.167	4.336	0.000	6.518
60	29.156	29.156	19.708	5.167	4.336	0.000	6.518
65	29.156	29.156	19.708	5.167	4.336	0.000	6.518

Title : Riverside County Subarea 2030
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season : Annual
Area : Riverside (SC)
****

Year:2030 -- Model Years 1985 to 2030 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Apr 23 2003

Riverside (SC) Riverside (SC) Riverside (SC)

Table 2: Starting Emissions (grams/trip)

Pollutant Name: Reactive Org Gases Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.006	0.010	0.036	0.059	0.281	0.652	0.017
10	0.012	0.020	0.072	0.115	0.548	0.804	0.031
20	0.023	0.038	0.139	0.218	1.039	1.095	0.057
30	0.033	0.055	0.203	0.309	1.472	1.370	0.081
40	0.042	0.071	0.262	0.388	1.849	1.629	0.104
50	0.051	0.085	0.318	0.455	2.169	1.872	0.124
60	0.059	0.098	0.369	0.510	2.431	2.049	0.142
120	0.090	0.150	0.578	0.574	2.733	2.316	0.204
180	0.088	0.147	0.578	0.609	2.900	2.344	0.203
240	0.093	0.156	0.614	0.643	3.062	2.492	0.216
300	0.098	0.165	0.650	0.676	3.218	2.637	0.228
360	0.104	0.174	0.685	0.707	3.369	2.779	0.240
420	0.109	0.183	0.720	0.738	3.515	2.918	0.252
480	0.114	0.191	0.755	0.767	3.655	3.054	0.264
540	0.119	0.200	0.789	0.796	3.790	3.186	0.275
600	0.124	0.208	0.824	0.823	3.920	3.316	0.287
660	0.129	0.217	0.857	0.849	4.045	3.443	0.298
720	0.134	0.225	0.891	0.874	4.164	3.567	0.309

Pollutant Name: Carbon Monoxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.094	0.151	0.417	0.965	3.472	2.980	0.211
10	0.186	0.299	0.824	1.890	6.802	3.588	0.404
20	0.362	0.582	1.608	3.624	13.041	4.754	0.773
30	0.529	0.848	2.351	5.201	18.715	5.852	1.119
40	0.686	1.098	3.054	6.621	23.824	6.881	1.441
50	0.834	1.333	3.716	7.884	28.370	7.842	1.740
60	0.972	1.551	4.337	8.991	32.351	8.735	2.015
120	1.522	2.389	6.788	10.500	37.780	12.366	2.949
180	1.434	2.258	6.506	10.806	38.885	11.987	2.843
240	1.551	2.435	7.055	11.123	40.026	13.005	3.045
300	1.654	2.592	7.540	11.451	41.203	13.945	3.227
360	1.744	2.730	7.961	11.788	42.416	14.807	3.389
420	1.821	2.848	8.319	12.135	43.666	15.592	3.530
480	1.885	2.947	8.611	12.493	44.953	16.300	3.650
540	1.935	3.026	8.840	12.860	46.276	16.929	3.751
600	1.972	3.085	9.005	13.238	47.635	17.482	3.831
660	1.996	3.125	9.106	13.626	49.031	17.956	3.890
720	2.007	3.146	9.142	14.024	50.463	18.354	3.929

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.042	0.080	0.598	0.233	1.390	0.154	0.130
10	0.045	0.087	0.638	0.351	2.094	0.193	0.145
20	0.051	0.098	0.710	0.559	3.331	0.262	0.171
30	0.057	0.108	0.772	0.728	4.338	0.320	0.194
40	0.061	0.116	0.822	0.858	5.117	0.365	0.211
50	0.064	0.122	0.862	0.950	5.667	0.398	0.225
60	0.066	0.127	0.892	1.004	5.988	0.419	0.234
120	0.071	0.136	0.964	1.011	6.031	0.421	0.248
180	0.072	0.137	0.965	1.008	6.009	0.418	0.248
240	0.071	0.136	0.958	1.002	5.975	0.411	0.247
300	0.070	0.134	0.946	0.994	5.929	0.403	0.244
360	0.069	0.132	0.930	0.985	5.872	0.393	0.240
420	0.068	0.129	0.909	0.973	5.803	0.382	0.235
480	0.066	0.126	0.884	0.960	5.723	0.368	0.230
540	0.064	0.122	0.854	0.944	5.630	0.353	0.223
600	0.061	0.117	0.820	0.927	5.526	0.337	0.215
660	0.058	0.112	0.782	0.907	5.410	0.318	0.206
720	0.055	0.106	0.739	0.886	5.283	0.298	0.197

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	12.235	15.336	21.415	2.744	5.206	13.265	13.881
10	13.724	17.242	24.370	5.473	10.384	15.462	15.749
20	17.203	21.679	31.136	10.886	20.652	19.776	20.041
30	21.353	26.951	39.043	16.237	30.805	23.983	25.071
40	26.171	33.059	48.090	21.528	40.843	28.082	30.842
50	31.658	40.003	58.278	26.758	50.765	32.074	37.351
60	37.815	47.782	69.607	31.928	60.573	35.959	44.601
120	88.214	111.138	159.436	54.304	103.024	53.408	102.404
180	100.119	126.177	181.320	64.156	121.715	57.647	116.394
240	112.008	141.187	203.092	73.426	139.303	61.636	130.322
300	123.880	156.167	224.751	82.115	155.788	65.377	144.188
360	135.736	171.117	246.297	90.223	171.169	68.869	157.992
420	147.576	186.037	267.730	97.749	185.447	72.112	171.734
480	159.399	200.928	289.051	104.693	198.623	75.107	185.413
540	171.207	215.789	310.260	111.057	210.694	77.852	199.031
600	182.998	230.620	331.355	116.838	221.663	80.349	212.586
660	194.772	245.421	352.338	122.038	231.529	82.598	226.080

720	206.531	260.193	373.208	126.657	240.291	84.597	239.511

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.001	0.000	0.000
40	0.000	0.000	0.001	0.000	0.001	0.000	0.000
50	0.000	0.000	0.001	0.000	0.001	0.001	0.000
60	0.000	0.000	0.001	0.000	0.001	0.001	0.000
120	0.001	0.001	0.002	0.001	0.002	0.001	0.001
180	0.001	0.001	0.002	0.001	0.002	0.001	0.001
240	0.001	0.001	0.002	0.001	0.002	0.001	0.001
300	0.001	0.002	0.002	0.001	0.002	0.001	0.001
360	0.001	0.002	0.003	0.001	0.002	0.001	0.002
420	0.001	0.002	0.003	0.001	0.003	0.001	0.002
480	0.002	0.002	0.003	0.001	0.003	0.001	0.002
540	0.002	0.002	0.003	0.001	0.003	0.001	0.002
600	0.002	0.002	0.003	0.001	0.003	0.001	0.002
660	0.002	0.002	0.004	0.001	0.003	0.001	0.002
720	0.002	0.003	0.004	0.001	0.003	0.001	0.002

Pollutant Name: PM10 Temperature: 70F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.001	0.001	0.001	0.000	0.001	0.007	0.001
10	0.001	0.002	0.002	0.001	0.002	0.006	0.002
20	0.002	0.004	0.004	0.001	0.003	0.005	0.003
30	0.003	0.006	0.006	0.002	0.005	0.004	0.004
40	0.005	0.007	0.008	0.003	0.006	0.003	0.006
50	0.006	0.009	0.010	0.003	0.007	0.003	0.007
60	0.006	0.010	0.011	0.004	0.008	0.003	0.008
120	0.011	0.017	0.019	0.005	0.011	0.006	0.013
180	0.012	0.019	0.021	0.005	0.011	0.008	0.015
240	0.013	0.021	0.022	0.005	0.012	0.011	0.016
300	0.014	0.022	0.024	0.005	0.012	0.012	0.018
360	0.015	0.024	0.026	0.006	0.012	0.014	0.019
420	0.016	0.025	0.027	0.006	0.013	0.016	0.020
480	0.016	0.026	0.028	0.006	0.013	0.017	0.020
540	0.017	0.026	0.028	0.006	0.014	0.018	0.021
600	0.017	0.027	0.029	0.006	0.014	0.019	0.021
660	0.017	0.027	0.029	0.007	0.014	0.019	0.021
720	0.017	0.027	0.029	0.007	0.015	0.019	0.021

```
Title    : Riverside County Subarea 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                      Riverside (SC)               Riverside (SC)

                             Table   4:  Hot Soak Emissions (grams/trip)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL

     Time
      min       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

        5      0.007    0.013    0.012    0.002    0.026    0.055    0.010
       10      0.014    0.026    0.024    0.005    0.049    0.106    0.019
       20      0.027    0.048    0.045    0.009    0.088    0.200    0.036
       30      0.038    0.069    0.065    0.013    0.121    0.284    0.052
       40      0.043    0.078    0.075    0.015    0.135    0.323    0.059

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes
(about 25% of in-use trips).


Title    : Riverside County Subarea 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                      Riverside (SC)               Riverside (SC)

                             Table  5a:  Partial Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.000    0.000    0.000    0.000    0.000    0.073    0.001


Title    : Riverside County Subarea 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                      Riverside (SC)               Riverside (SC)

                             Table  5b:  Multi-Day Diurnal Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.000    0.000    0.000    0.000    0.000    0.007    0.000
```

```
Title    : Riverside County Subarea 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table  6a:  Partial Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.011    0.028    0.037    0.001    0.001    0.073    0.019


Title    : Riverside County Subarea 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table  6b:  Multi-Day Resting Loss Emissions (grams/hour)

     Pollutant Name: Reactive Org Gases        Temperature: ALL   Relative Humidity: ALL

     Temp
     degF       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       70      0.001    0.002    0.003    0.000    0.000    0.007    0.001


Title    : Riverside County Subarea 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table   7:  Estimated Travel Fractions

     Pollutant Name:                           Temperature: ALL   Relative Humidity: ALL


                LDA      LDT      MDT      HDT      UBUS     MCY      ALL

    %VMT       0.508    0.358    0.074    0.054    0.002    0.003    1.000
    %TRIP      0.486    0.343    0.115    0.050    0.000    0.005    1.000
    %VEH       0.506    0.362    0.073    0.041    0.001    0.017    1.000
```

```
Title    : Riverside County Subarea 2030
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 06/28/06 11:45:43
Scen Year: 2030 -- Model Years: 1985 to 2030
Season   : Annual
Area     : Riverside (SC)
*****************************************************************************************
     Year:2030 -- Model Years 1985 to 2030 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     Riverside (SC)                    Riverside (SC)               Riverside (SC)

                             Table   8:  Evaporative Running Loss Emissions (grams/minute)

     Pollutant Name: Reactive Org Gases        Temperature:  70F  Relative Humidity: ALL
```

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.007	0.193	0.327	0.181	0.836	0.004	0.109
2	0.006	0.099	0.166	0.091	0.423	0.036	0.056
3	0.006	0.069	0.114	0.062	0.286	0.053	0.041
4	0.007	0.055	0.090	0.047	0.219	0.063	0.033
5	0.008	0.047	0.075	0.039	0.179	0.069	0.029
10	0.010	0.032	0.047	0.022	0.101	0.081	0.022
15	0.011	0.027	0.038	0.016	0.077	0.083	0.019
20	0.011	0.025	0.035	0.014	0.067	0.084	0.018
25	0.011	0.024	0.033	0.013	0.062	0.084	0.018
30	0.011	0.024	0.032	0.012	0.061	0.083	0.017
35	0.010	0.023	0.031	0.011	0.060	0.081	0.017
40	0.010	0.023	0.030	0.011	0.060	0.080	0.017
45	0.010	0.023	0.030	0.010	0.059	0.079	0.016
50	0.010	0.022	0.029	0.010	0.058	0.078	0.016
55	0.010	0.022	0.029	0.010	0.058	0.077	0.016
60	0.010	0.022	0.028	0.009	0.057	0.076	0.016